Department of Economics and Finance
Global Political Economy Research Unit

Measures of Environmental and Sustainable Socioeconomic Welfare and the Political Economy of Capitalism—Theoretical Reconstruction, Technical Specification, and Critical Analysis: GDP, ISEW and GPI

Andrew John Brennan

This thesis is presented for the Degree of
Doctor of Philosophy
of
Curtin University of Technology

November 2009

Declaration

To the best of my knowledge and belief this thesis contains no material previously published by any other person except where due acknowledgment has been made.

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university.

Signature: .....

Date: 11 November 2009

Abstract

This study undertakes a critical analysis of measures of environmental and sustainable socioeconomic welfare from the perspective of political economy. One of the prime motivations for such an inquiry is that Gross Domestic Product (GDP) provides an inadequate measure of social and ecological waste in the economic system. Good measures with solid theory (or theories) can offer vital insights where there may be conflict between the various spheres of economy, society and ecology. The inquiry centres on measures that may be referred to as 'Net Income Indices' or Sustainable Economic Welfare Indicators (SEWIs), since they are designed for assessing aspects of sustainability and welfare. Commencing in 1972 and ending in April 2009, there have been forty-five individual studies involving construction of a SEWI. SEWIs are worthy of a comprehensive appraisal as it is generally accepted that the indices are necessary, workable and adequate measures. This study embarks on a systematic, detailed and scholarly examination of the conclusions drawn in the relevant literature on SEWIs, focusing on the calibre of their theoretical, empirical and technical foundations, historical specificity vis-à-vis business cycles and institutional dynamics.

For any study into sustainable well-being, the key focus is the effects of market institutions on society. GDP has many limitations, but GDP is charged with significance because it aids our understanding of the capitalist system, however, the same cannot be said for SEWIs. It is argued that the net income indices are not very good measures of environmental and social welfare: many authors provide no major good or detailed advancement in theory and no one provides a strong socio-historical institutional analysis. Critically absent from every SEWI analysis is a systematic understanding of the political economy and system dynamics of capitalism. This led to the major hypothesis, which states: *understanding the political economy of capitalism will provide vital insights into SEWIs*. SEWI advocates have started with ceteris paribus assumptions where medium and long-term processes are not affecting the socioeconomic system. Because *ad-hoc commonsensical accountancy prevails*, the authors are inadequately accounting for the present well-being effects on the social structure, and do not consistently, as done for ecological capital depreciation, value the future generational costs (lost services) of an (un)sustainable social capital and human-health capital base. SEWI restricts the analysis to a few monetary variables and thereby it is too inflexible and not very helpful.

Yet, such social services and disservices are elementary for critically evaluating the multiple contradictions of capitalism in a disembedded economy (where the 'economy' tends to dominate other aspects of culture). *Multiple contradictions assess the complexity of the disembedded economy better than single contradictions*. SEWI advocates focus mainly on the contradiction (i.e. the trade-off) between the natural environment and consumption goods, and their inquiry is, at the most, limited to the national level. It is argued that they are in a *one-and-a-half contradiction world*: they see primarily one contradiction and a partial social reality from a very nationalistic perspective. In the global disembedded economy, all areas of life are both relatively autonomous yet interconnected. There are multiple contradictions of capitalism to be explored, but it is hard to link all of them in one index. It is necessary to transcend the one-and-a-half contradiction world and have a broad view of wealth.

It is difficult to determine the true nature of the "service" and its distribution to persons-in-community in an exclusive aggregated net-income index. *Composite net-income indicators inadequately measure distribution*. Without fundamentally understanding the heterogeneous power relations that define the system's reproduction, applications of 'Net Income Indices' are ineffective. It is argued that there are major limits to which SEWIs can be transformed or radically redeveloped within the context of the political economy critique. *The crux of the problem is that SEWI advocates fail to incorporate an understanding of the historical socioeconomic system of capitalism (as the fundamental background condition), which affects their whole project*. A tendency for the literature to abstract from real trends in the disembedded economy is apparent because of the weak institutional apparatus, mechanical applications, and conceptual difficulties. This thesis raises questions about the competence of SEWIs to deal with real-world problems. A more detailed and broader approach to sustainable well-being is needed to find the root of social and environmental problems.

Acknowledgements

As I reminisce, this thesis could not have been possible without prayer and the saturation of love surrounding me. I am ever so grateful to the Lord Jesus for giving me Phil, such an outstanding mentor, scholar and friend. Phil and I have built a strong relationship over many years, and our fellowship together has been a real positive experience, jammed-packed full of interesting debate, mirth and bonding, made all the more enjoyable with good food, music and singing. Phil reciprocates what was done for him when he was a burgeoning student of political economy, where the professor shouts the student for lunch or tea when meeting to discuss the relevant materials—and due to my relatively long tenure as a post-graduate student, we have enjoyed at least over one hundred and thirty delicious meals together! Fortnightly (and sometimes weekly) meetings with Dr. Phillip O'Hara have thus been uplifting and rewarding, and receiving his timely critical comments was essential; it has been a true blessing to work with such an affectionate and caring man, and I am indebted to his superb supervision.

Sharon Brennan, my darling, tenderhearted wife and best friend, no doubt plays the main role in my life, and I thank her deeply for all her patience, fidelity and her sensational food preparation and cooking. She is a wonderful listener and reassurer, always there to lift me up when (on the many occasions) I was feeling down and lacked confidence. Much self-sacrifice on her behalf was made so that my studies could progress: a low household money-income flow; often living in stressful circumstances such as in the caravan, renting, travelling to-and-from the many houses we subsisted in; and the countless hours that we spent apart (on Saturdays and most weeknights) when I was "finishing off that chapter". Yet it has been all worthwhile under the sun. I have cherished our good and trying moments together as partners in marriage, and I will continue to love everything about her.

It is also marvellous to have such great parents. I am sincerely grateful to Marilyn and John Brennan for their faithfulness and nurturance throughout my whole life. The value of my mother and father's unpaid familial and caring labour—ongoing guidance, moral discipline, financial support, theological discourse, various provisions (e.g. meals, sewing alterations), dad's English-grammar teaching, proofreading and general helpfulness, mum's sensitivity, high level of ingenuity, and sharp eye for colour-coordination and shape-delineation (especially of tables, figures and fonts) and so on—is immeasurable. I am also very appreciative of my mother and father in-laws, Audrey and Clive McMullen, for providing us with a dwelling place and giving up their personal space, and I have thoroughly enjoyed eating those mouth-watering Indian curries. Living under the one roof with the in-laws and coming to know Brendon McMullen and Sharon Haseldine has been a

heart-warming, congenial and sharing experience.

To the Walkers: Suzy, Russell, and the beautiful children, Izabella and Emily, thank you all for your heartfelt encouragement, and the fun times had at home and holidaying on the North coast of Western Australia. To all my relatives and close friends: many cheers for your constant words of hope and gracious understanding that I could not see you much during these times. Rhoda O'Hara is dearly missed but the fond memories remain.

I would also like to thank Jo Boycott (Research Student Coordinator) who always assisted me and greeted me with a cheerful curiosity. I express gratitude to all the other staff/academics I met at Curtin University, the Centre for Development Studies (Kerala, India), and the Seventh Society of Heterodox Economists Conference, as well as for the funding/travel support (including the stipend from the Australian Postgraduate Award). To all the members at the local church of Endeavour Christian Gathering: to be part of a loving, Christ-centred and authentic community has been thought-provoking and spiritually wholesome, seeing as "such knowledge is too wonderful for me" (Psalm 139:6).

I love all of the above people and I give thanks from the very depths of my being for the significant influence you have had on my research and my life.

Chapter Outline

Table of Contents

Chapter 1.
Introduction

When we make choices there are trade-offs involved, since we face limitations, such as time, space, finance, knowledge and/or the institutional arrangements. Depending on a person's evaluation system, the trade-off may be desirable or undesirable, positive or negative. Sometimes the choices the individual makes are socially constructed, constrained or restricted. For instance, an individual may not want to sacrifice time in the home for childrearing, but finds that s/he needs to work extra hours in paid employment to cover living expenses. However, it is true that the individual does have *an element* of free choice and thus control over the positive or negative consequences of the trade-off endured or expected to endure. But, to a large degree there is a lack of control by an individual in modifying society's choices—this is the source of numerous real world problems.

One of the major problems is the fruitful heritage of ecological beauty being systematically and vehemently destroyed. A substantial array of heterogeneous species' populations and habitats (corals, wetlands, forests) are either dwindling or becoming extinct over recent decades (WWF 2008:40). A reduction in the extent and condition of natural habitats largely reflect these declining populations. Species decline is happening *despite* the mounting protection of habitat loss and degradation (UNEP 2007). Environmental degradation is happening locally, regionally and globally, through the replacement of the natural environment by material goods and services. While one can 'do our bit' to help alleviate ecological destruction in a small way, the powerlessness of the individual to radically change society's choices in the short-to-medium term is the tangible reality. The consequences of the trade-off from natural environment to worldly possessions are thus a more serious problem at the global, regional and local macro-level as opposed to the individual micro-level. There are powerful market-political forces at work with a tendency to destroy forms of wealth such as old growth forests, fish stocks, wildlife, and social relationships.

Another vital concern that requires a global, regional, national and local perspective is the health of persons, particularly the poor. With the large-scale commitment to the Millennium Development Goals (MDGs) in the 2000s, poverty and the deplorable health condition of the world's poor have finally reached pre-eminence in the international policy arena, and foreign aid for health has greatly increased. But, there is still not enough funding to meet poor countries' basic needs, and the quality and effectiveness of existing aid and the efficiency of current public spending is deficient (Schieber *et al.* 2007:925). Today's global health lacuna is entrenched in political economy. In such a framework, health is

expendable when other interests, such as national security, are perceived to be at risk (Erikson 2007:168, 2008:1230). The prevailing paradigm is at odds with global-health trade-off realities: human health is one of many competing concerns in preference to it being a featured and privileged one.

Understanding the nature of trade-offs in the market political economy is therefore critical. The chief motif and major theme of this thesis is to understand the salient factors responsible for the growing incidence of external diseconomies (costs) imposed on the public at large by market activities. We are thus interested in the activities that affect *social welfare* from the accumulation of capital (à la economic growth). In essence, this study centres holistically on the following fundamental trade-off question: To what extent do the losses associated with economic growth offset the gains?

When evaluating this basic trade-off, there is a time dimension to consider. Kenneth Boulding (1966c:10) in "The Economics of The Coming Space-Ship Earth" argues that the social welfare of human beings depend on the degree to which they can identify with others, in the community through space and time. Boulding realised that genuine progress must meet the needs of the individual while being sustainable and equitable over time. How do we measure the trade-offs, i.e. the positives and negatives of sustainable and equitable welfare attainment? A well-devised indicator that measures the costs and benefits of economic growth over time may help.

A socioeconomic indicator is supposed to provide a summary measure of the progress or development of the people of a region. Indicators of social and environmental welfare can help people understand the degree of progress achieved in significant matters (e.g. air and water pollution, sociality, morality, etc.). The beneficial outcome of a good well-being measure is that it allows for deliberations on areas that may need improvement. The extent to which an indicator can describe the prevailing socioeconomic system is also a crucial factor determining the usefulness of the measure. Good measures with solid theory (or theories) can thus offer critical insights where there may be conflict between the various spheres of economy, society and ecology.

However, there is much controversy as to what is a valid measure. All indicators are subject to criticisms, because the very nature of their construction involves a simplification of a very complex reality. Furthermore, it is important to note that indices are not developed *outside the system*; they are the product of lengthy discourse on socioeconomic areas of inquiry, and are influenced by vested interests. Hence, the key for the critical social observer is to identify the implicit value judgements embedded in the indicator's conceptual framework. The research problem in this study thus involves scrutinising social and

environmental welfare indicators and offering a critique if the assumptions or theoretical foundations or empirical studies are unsound.

Seven critical hypotheses are raised to direct the path of this study. Note that the hypotheses are not empirically rejected/accepted *per se* or stringently tested by econometric models. In this study, the 'hypothesis' is utilised as a tool to guide the critical conclusions of the research. In this sense, hypotheses act as general stylised claims derived from critical thinking about the literature on sustainability and social welfare. Evidence in support of the hypotheses is to be evaluated by means of contextual validation (i.e. 'storytelling') and the principles of holism. The advantage of storytelling over more formal methods (e.g. logical positivism) is to espouse concreteness rather than abstraction from reality. From the viewpoint of holism, the primary function is to promote "understanding" (see Dugger 1977:306-8). Hence, these techniques are a procedure for verifying different kinds and sources of facts, and the hypothesis serves as an indirect means of evaluating the plausibility of one's initial interpretations (see Wilber and Harrison 1978).[1]

The traditional measure of performance is gross domestic product (GDP). GDP is simply the *gross* monetary total of 'final' goods and services exchanged over time in the home market. The growth rate of real GDP per capita is often used to indicate national, regional or global 'economic growth' or the growth in income, output, or expenditure. The value of goods and services is formulated in the *United Nations System of National Accounts* (UNSNA), which is generally published by a national statistical bureau, such as Sweden's Statistiska centralbyrån, the Instituto Nacional de Estadísticas (Chile), Banco de Moçambique (Mozambique), and the Australian Bureau of Statistics. The essential function of the SNA is to provide a systematic summary of national economic activity. The national accounts are a significant social accomplishment because they offer extensive, detailed, and independent scorecards.

Historically, there is often a positive link between economic growth and welfare. For instance, most notably during the 1950s and 1960s, the broad population of West Germany was lifted out of squalor as economic growth facilitated infrastructural rebuilding (known as Wirtschaftswunder). Under a program of state–industry cooperation, a strong work ethic, and mastery of high technology, Japan achieved spectacular growth during the 1960s–1980s and now is the third-largest economy in the world after the US and China (CIA World Factbook 2008). During the high growth periods of the late 1990s and early 2000s, Ireland overcame its long-standing trend of people leaving the country (CSO

[1] Diesing (1971) remarks: "[t]he holist believes in the primacy of subject matter; he [or she] believes that whatever else a method may be, it should at least be adequate to the particular thing described and should not distort it".

2004). Growth in China during the 1990s–2000s enabled Chinese in urban areas to experience higher standards of living, for example, greater quantities and varieties of food (Fishman 2005:127).

However, poverty endures in regions where income and growth performance has been deficient. Poverty and economic stagnation or decline are predominant characteristics of Sub-Saharan Africa and parts of Latin America. According to UNECA (2008:63), the main challenges facing Sub-Saharan Africans in the labour market are the lack of decent jobs in the formal sector, underemployment, particularly in rural areas, and working poverty. Despite the significant increase in primary school enrolments in Sub-Saharan Africa of late, only 60 percent of children in Sub-Saharan Africa actually complete the full cycle of primary education (UNESC 2008:14). In Latin America, Lopez and Perry (2008) argue that the widespread tendency to *underinvest in productive durable fixed assets and social resources* has perpetuated a vicious circle of persistent poverty, insecurity and unstable growth, marked by the "lost decade" of the 1980s, the "lost half-decade" of 1998–2002 and a period of weak performance between the two. These initial weaknesses tend to keep them stuck on a path of low GDP and productivity growth. Consequently, an inadequate level of economic growth over a long period *may* imply a low level of economic welfare.

The first hypothesis, H1, of this study thereby states that:

H1: Economic growth provides a good measure of wealth and welfare.

Generated by competition and technological innovation, economic growth and the accessibility of credit enable a greater range of opportunities. Economic growth is often a good proxy for welfare. Economic growth offers so many wonderful things, namely, a greater range of commodities and services, the opportunity to travel, work and study, and so on. Individuals can purchase high-performance shoes, cheap digital cameras, quality colour printers and ultra-comfortable furniture and bedding. Many people think that economic growth will give them ever-increasing economic welfare. H1 is topical as most citizens and leaders have a strong tendency to support growth-orientated policies (e.g. see Rankin 2006:24-7).

Human thinking tends to fall back on the popular belief that a per capita increase in real monetary income is a good thing in *itself*. Some fundamental questions, however, arise. Can we merely assume that output, or output per head, is a measure of economic progress? What is genuine economic welfare: GDP, income, production, or consumption? What were the earlier judgements of economists (such as Irving Fisher and Simon Kuznets) of what constitutes the wealth and welfare of a

nation, before the national accounts became first institutionalised in 1948? *Chapter 2* provides an economic, social and ecological historical overview of the relevant literature on these questions. A scrutiny of the concepts of 'income', 'wealth', 'consumption' and 'production' is essential for an understanding of the controversies surrounding 'economic growth' and 'GDP' (H1).

Kuznets, for instance, argued that the System of National Accounts poorly represented what 'national income' as the concept had been understood as in its long history, i.e. from a social economics perspective (e.g. see Kendrick 1970, Perlman and Marietta 2005). He understood national income as a sustained increase in its magnitude of *services* over a long-term trend (e.g. see Kuznets 1947:13, 1948:156,160). Hence, in this study, the notion of *income* in the 'service' sense is significant. Income can be defined as the *flow of services* from wealth (capital). But the flow of services need not be positive. There can be disservices, also known as negative income. Therefore, the concept of *net* income is a vital one because it considers the net positives and negatives of economic activity. We argue that "economic growth" was historically understood as 'net income' (genuine welfare of society) and, therefore, only in this context hypothesis one (H1) is acceptable.

The path in which "economic growth" was heading was indeed a prolific one, with possible revolutionary positive implications for society. But, with the formal institutionalisation of the US system of national accounts in 1948 (1953 at the global level), 'economic growth' signifies market-based production activities and *not* 'net income'. In other words, in any case post-1948, economic growth is synonymous with the growth rate in GDP. GDP growth relates to the rate at which the *marketed* value of goods and services is expanding in a specific region (e.g. the world or a continent). This is an important dimension of capitalism. Markets are closely linked to capitalism, which, in the process of creative-destruction, requires them to grow in order to expand. GDP growth per capita (short and long term) may help comprehend capitalism (even critically).

A critical approach to GDP growth entails an exploration of the system's conditions. Veblen, for instance, examined the complex mechanisms responsible for the rise and decay of social *and* ecological organisations. He argued that real service creation is problematic especially when "converting all public wealth to private gain" under a system of absentee ownership (Veblen 1923:168). All four of the great political economists, Marx, Veblen, Keynes, and Schumpeter understood that capitalism as a revolutionary system entails rapid change. As continuous instability, conflict and disarray are natural to capitalism, the costs (disservice) of this process for capital and society can be large. That is, the system has a positive and negative side, where service is reproduced along with disservice.

However, there are several well-known problems with GDP. For instance, transactions that add or reduce welfare are difficult to distinguish. At least historically, humanity has treated the economic system as if it could enter into uninterrupted exchange with an infinite reservoir of ecological assets. GDP usually provides no indication of whether we are living off income or capital, and treats the depletion of materials such as coal, oil, gas, forests, and soils as *positive* capital consumption. Sustainable production in GDP is treated the same as unsustainable consumption. Thus, there is a failure of economic growth and GDP to account for destruction of the environment. On this issue, the views of prominent ecological economists, Kenneth Boulding and Herman Daly, are considered. Maximising economic growth provides no indication of the enhancement or deterioration of real wealth and welfare. This is because, as argued by Boulding (1949-50:79), the objective of economic policy should not be to maximise consumption or production, but rather to minimise it while expanding the range of net positive services.

GDP in the national accounts may be a good proxy measure of economic *growth* but not when 'net contributions to welfare' are at the heart of the inquiry. This is because, as chiefly argued by Daly (1978, 1991, 1996), the 'eco-development' notion of progress in 'economic growth' and GDP has been misplaced concretely. GDP accounting does not differentiate growth from sustainable development. Growth means a *quantitative* increase in the scale of goods and services of the economy. Sustainable development means a *qualitative* improvement in the structure, design and composition of the institutions that result from greater knowledge and understanding of social progress. Moreover, the greener accounting system, the *System of Integrated Environmental and Economic Accounting* (SEEA-2003) (United Nations *et al.* 2003), is limited in measuring net welfare.[2] The line of thought in the SEEA-2003 reflects the reliance on "asset" (or "capital") rather than "service" thinking. "Economic growth" in the SEEA-2003 is still narrowly defined as real GDP growth, *not* sustainable development, green GDP or net income. H1 must therefore be rejected, because the 'development' notion of progress in 'economic growth' and GDP has been misplaced concretely.

The major conclusion in *Chapter 2*, therefore, is that economic growth—the growth of GDP per capita—is not a very good measure of wealth and welfare. Utilising GDP as a prime indicator of growth, performance *and* welfare *may* be problematic. Indeed, much of the criticism of economic growth has arisen from the enormous negative social externalities (disservices) generated from the 'growth fetish' in

[2] The function of SEEA-2003 enables a detailed assessment of the stocks of various natural resources, and the flows of expenditures, taxes and subsidies related to environmental protection or management by various sectors.

human activities. GDP growth incurs costs such as the disturbance of ecological life-supporting systems, pollution, alienated labour, lost leisure time, and the loss of welfare for future generations. If a high level of GDP is the ultimate policy goal, then clearly it is a misused index to represent social welfare. Hence, adjusting or modifying GDP to construct some sort of 'net value' of environmental and socioeconomic welfare is *potentially* important. At the end of *Chapter 2*, we introduce several measures of 'net income'; there is likely a need to modify or go beyond GDP.

One of the most significant indicators of net income is the Index of Sustainable Economic Welfare (ISEW). Herman Daly and John Cobb (1989) in their groundbreaking book, *For the Common Good*, pioneered early work into developing a more appropriate measure of welfare. They devised the very first ISEW; for the US over the 1950–1986 period (see Cobb 1989). Their work was significant because it was the first indicator assessing economic welfare with attention to income distribution *and* environmental destruction. An adjustment for income inequality in the ISEW was based on the premise that the benefits of economic growth may disproportionately advantage the rich. It also gave attention to environmental sustainability, such as the costs of long-term environmental damage, including climate change, air, water and noise pollution. They argue that accounting for sustainability is needed in a measure of welfare, especially when it affects future generations.[3] In this study, we seek to understand the ISEW (and other similar indices) in detail. Good conceptual foundations are required for the ISEW, and this are the focal point of *Chapter 3*.

This leads to the introduction of hypothesis two (H2)—viz.:

H2: The ISEW has strong theoretical foundations.

A primary function of *Chapter 3* is to interpret and apply conceptual foundations to ISEW. This is needed to establish a level playing field—to understand the evolution of similar sustainable economic welfare indicators and to present them in their best light. It is not only the purpose of this paper to provide insight into the theoretical foundations of ISEW, but also to offer a critique, if reasonable. But even if it is not possible to fill the gaps completely, it is argued that there are three underlying and qualitatively different theories of ISEW (H2).

The focal point of the three theories is to evaluate the positives and negatives of economic growth, with the hope of achieving a practical measure of sustainable economic welfare. In order to promote specificity

[3] Note that Daly and Cobb's ISEW is a more sophisticated measure to earlier measures, such as the Measure of Welfare (MEW) (Nordhaus and Tobin 1972) and Economic Aspects of Welfare (EAW) (Zolotas 1981). However in this study, we delimit the scope of the analysis to ISEW and related measures developed thereafter.

vis-à-vis the theoretical foundations of ISEW, Venn diagrams and set theory notation are utilised. The purpose of the Venn diagrams is to illustrate the similarities and differences between the theories. The usefulness lies in the visual comparative analysis, specifically: How well does each theory link the spheres of economy, ecology and society? Indeed, the conceptual foundation of ISEW depends on the answer to this question.

A scrutiny of Daly and Cobb's (1989) work reveals a theoretical framework—albeit somewhat concealed and fragmented—for ISEW. Thus, the first theory explores Daly and Cobb's conceptual "*economics for community*" model for ISEW, which considers the costs and benefits to the whole community, not merely individual agents involved in a transaction. The second theory links Fisher's concept of income to entropy: *entropic net psychic income*. This theory is important because it specifies that it is a cost to replacing worn out producer goods such as plant, machinery, and equipment. The third theory suggests that ISEW is theoretically based on a *social welfare function*. Utilising some principles of welfare economics, the ISEW integrates cost-benefit analysis with social choice theory, which incorporates various social concerns about welfare that are not adequately captured by individuals within the market place. Hence, it is argued that there are several substantive theories to support ISEW.

However, there are major limitations in the approach to sustainable development as construed by the advocates of ISEW. In relation to hypothesis two, H2, the three theories are not as well developed as they should be: they have partial, underdeveloped explanations of the benefits (services) and costs (disservices) generated in the system. The system not only creates 'services' and waste (disservice), but also has a tendency to obstruct or destroy progressive service potential. This was clearly articulated by Karl Polanyi in *The Great Transformation* (1944), who argues that sustainable social arrangements are irreconcilable with an economy founded solely on a self-regulating market organisation (Polanyi 1957:73). This is because the system tends towards instability if left alone, and thereby requires the insertion of new forms of reciprocity, redistribution and informal marketplace changes to create 'system functions'.

Under a self-regulating market organisation, the economy tends to dominate other aspects of culture. This is known as the 'disembedded economy'. In line with Polanyi's (1944) thesis, the market system tends to destroy the services of existing capitals of taste, tradition, character, nature, community and values in its search for expanding markets which *may* yield ongoing (if doubtful) services of new technological institutions. It is argued that the theoretical particulars of ISEW abstract from the workings of the capitalist system, because the ISEW advocates have not

specified a society in the socioeconomic system *that we currently have*. Specifically, there is no underlying linked systems view of the disembedded economy. Without a systematic understanding of the political economy of capitalism, the ISEW, as expressed by hypothesis two, H2, is potentially flawed in design.

Yet, several questions remain unanswered in chapter three. Is the ISEW project simply mistaken or is there some way of transforming it within the context of a political economy critique? There are two paths that we may take, either abandoning the ISEW approach or finding a way to integrate it with the political economy critique. The extent to which we can incorporate the challenges posed by the political economy theory is the critical factor determining the abandonment or redevelopment of ISEW. But, without undertaking a thorough empirical and technical scrutiny of the ISEWs (in the existing literature), it is difficult to ascertain the complete inadequacy of socioeconomic foundations in the index's construction. Nonetheless, the underlying problems of ISEW should become manifest in the critical empirical investigations from the perspective of political economy. The result will become evident as the critical appraisal continues in chapters four and five. We need to break away from the conceptual critique and into the empirical and technical scrutiny of ISEW *et al.* analyses.

In addition to ISEW, a number of alternatives to GDP that encompass environmental and social factors include the Genuine Progress Indicator (GPI), Sustainable Net Benefits Index (SNBI), and Fisherian Income (YF). Collectively, these composite measures may be referred to as 'Net Income Indices' or Sustainable Economic Welfare Indicators (SEWIs) since they are designed for assessing aspects of *sustainability* and *welfare*. 'Consumption' is the welfare base of the indicators and is taken directly from the System of National Accounts (SNA). But the authors utilise a variety of statistical sources and government reports to include other variables. Generally, the authors of SEWIs add the monetary service benefits yielded by *both* the stock of consumer and public durable expenditures (while adjusting personal consumption for income inequality) *and* household production, minus the environmental and social costs associated with production, distribution and exchange. We provide a detailed literature survey of empirical studies of these SEWIs in chapters four and five.

Directing the first literature survey, the following hypothesis (H3) will be scrutinised:

H3: Net Income Indices are good measures of environmental and social welfare.

Chapter 4 provides the first review, a comprehensive survey of the

literature on Net Income Indices. Thus far (up to April 2009), there have been forty-five individual studies in which authors have constructed net welfare indicators; and the historical application of indices span more than five decades. Each study is chronologically assessed. Additionally, studies that provide a non-technical critique or discuss limitations of the indicators are reviewed. Generally, this entails the following evaluation method: a) an introduction to the study; b) a presentation and commentary of the empirical results; c) a discussion of the most important conclusions; and d) any advances in theory or methods accomplished.[4] We scrutinise whether the authors follow or develop Daly and Cobb's oikonomia model, includes the 'net psychic income' notion, or apply social choice theory.

Each subsequent study to Daly and Cobb (1989) contributes to the literature to varying degrees. Jackson and Stymne (1996), in their Swedish ISEW study, for instance, provide a good comparative analysis with the UK ISEW over the 1950–1992 period. They argue that different social and environmental policies influenced the indicator's trend, e.g. there was a positive influence on Sweden's trend compared to the UK's level of welfare during the 1980s. The study into the Austrian ISEW (1955–1992) by Stockhammer *et al.* (1997) is also a notable one. The authors improved the consistency and clarity in the ISEW's conceptual framework. In addition, some authors have applied the ISEW to newly-industrialising economies. Clarke and Islam (2004, 2005a), for example, provide a detailed account of Thailand's socioeconomic and environmental situation. They construct a Thai ISEW (1975–1999), and include significant variables such as costs of corruption and sex work.

There are other interesting empirical studies. For example, a US GPI for 1950–1998 was constructed by *Redefining Progress* (e.g. Anielski and Rowe 1999). The GPI was an attempt to 'socialise' the ISEW: including volunteer labour and accounting for social breakdown (e.g. divorce) for the first time in a single index. In a comparative study of the GPI (1950–2000), Costanza *et al.* (2004) found that the GPI trend in the state of Vermont (US) was better than the national-level GPI. Vermont had a greener policy stance during the 1980s–1990s, e.g. hydro-electricity generation. In contrast, the US was reliant on fossil fuels for power generation. Another significant study undertaken at the subnational level was Pulselli *et al.* (2006) which compared Siena's local experience with the national Italian economy (see Guenno and Tiezzi 1998). Exploitation of non-renewable resources is a typical activity of the local area due to quarrying of ornamental stone, gravel and sand for construction. The authors argue that a substantial increase in the production inputs of energy and non-renewable resources greatly affected the level of net

[4] For practical reasons, a list of tables and figures at the beginning was not included in this manuscript because of the large number (and many pages) which would have to be added.

income in Siena.

However, while there are several good studies, some remarkable conclusions emerge out of the literature review in *Chapter 4*. Firstly, no author has specifically and consistently linked their analysis to Daly and Cobb's oikonomia theory—i.e. that the ISEW accounts for pervasive externalities affecting the long-term health of the community. Only Fisherian psychic income is developed in the literature to provide a basis for adjustments in the indicators (à la Philip Lawn 2003). Also, only one study employs the principles of welfare economics—by Clarke and Islam (2005) in their Thai ISEW. Secondly, there are inconsistencies in the authors' conclusions of their empirical results. For instance, over a comparable period in Australia, one study suggests sustainable welfare is attained (i.e. Lawn 2001), while the others implies *un*sustainable welfare (i.e. Hamilton 1997, Lawn and Clarke 2006b). Ambiguity in the 'true' depiction of progress is apparent.

Thirdly, and more notably, the root of my criticism is that a robust socio-historical institutional analysis is lacking in the empirical analyses—indexes tend to be mechanically applied. Many studies leave the reader uninformed regarding the long-term cyclical nature of the economy. A major problem relates to the merging of complex identities such as 'current welfare' and 'sustainability' into a single indicator. For instance, utilising Lawn's (2001) data reveals that including or excluding certain variables from the SNBI makes no difference to the trend in the indicator. The aggregated-index is thus completely futile *without* a socio-historical institutional explanation substantiating the results. Cracks begin to surface in the theoretical and empirical underpinning of the Net Income Indices.

Moreover, the majority of SEWIs are geared to the country of origin. Their analyses are good when examining the trade-off between natural and physical assets, but the problem is viewed in a national-centric fashion. The problems of human-induced climate change and species extinction, however, are *global* environmental problems (see Brennan 2004). For instance, globalisation has encouraged energy intensive products such as automobiles, electrical appliances, computers and paper. Increases in the volume of trade generates greenhouse-gases (see Nijkamp *et al.* 1998). This especially applies to global shipping (Garman 2007:23-4), air cargo and the large-scale expansion of industrial agriculture. The burning of fossil fuels primarily drives this accumulation of greenhouse gases; to serve the ever-growing energy needs associated with durable fixed business capital expansion. Therefore a one-country level of analysis has limitations: emissions build up as the pure scale of the human enterprise grows, as we continue to industrialise in an ever-more global economy. The chapter concludes that the vast majority of net income empirical studies are theoretically vacuous; lacking in social

dimensions; mechanical in copying the empirical methods of previous studies; and geographically narrow in their application. Such SEWI studies, vis-à-vis hypothesis three (H3), are relatively poor measures of environmental *and* social welfare.

Directing the second literature survey, an additional hypothesis (H4) will be scrutinised:

H4: Net Income Indices are innovative measures of welfare and capable of improvement.

Chapter 5 continues with the second literature review on the Net Income Indices, and in a similar organised format, each study is chronologically assessed, but specifically, it provides a *very detailed* appraisal of the *technical* differences or similarities within each indicator. A consistent approach is utilised to assist the technical analysis. Equations are devised for the indicator in each study, and the variables are appropriately organised into 'service' and 'disservice' parts. Which variables are common to the original ISEW template? What degree of innovatory practices have SEWI authors employed? To aid the investigation of this study, Venn diagrams and set theory notation are utilised. The purpose of the Venn diagrams is to provide a visualisation of the differences between the original templates and their successive derivatives. In short, we dissect the inclusions of new variables and whether there has been originality in techniques in order to investigate hypothesis four in more rigorous depth.

Several studies provide some very good technical advances. For example, Jackson and Marks (1994) criticise the original Daly and Cobb ISEW for estimating the costs of air pollution by utilising emissions of three priority pollutants (sulphur dioxide, nitrogen oxides and particulates) to provide an index of air pollution. They argue that the choice of pollutants—emissions which all decreased over the period in question—was non-representative, and ignored the impact of certain other air emissions, such as volatile organic compounds (VOCs) and carbon monoxide (CO), which tended to increase. This means, in particular, that the benefits of reduced particulate emissions are (incorrectly) attributed to the total emissions index. They argue that it would be more appropriate to account for the costs of each type of emission, and then to sum these costs.

For the first time in the literature, Hamilton and Denniss (2001) in their Australian GPI include socially relevant variables such as the costs of irrigation water use and problem gambling. They also enhance the indicator through 'time' specification. The Australian GPI adopts the following position: that time devoted to voluntary activities makes a positive contribution to welfare while time engaged in involuntary

activities diminishes welfare. For example, they account for involuntary work, i.e. the time when people are undertaking paid work but would prefer unpaid. 'Overwork' imposes a cost on workers and their families and it is thus deducted from the GPI. They also argue that the psychological costs of underemployment are large and should be taken into account in any attempt to assess changes in national well-being.

According to some leading ecological economists such as Philip Lawn, the indicators of net income are more comprehensive as a measure of income than GDP, because there is recognition of *services* and *disservices* flowing from the capital stocks. For instance, in the development of the Australian SNBI, 1966-67 to 1994-95, Lawn (2001, 2003, 2005) explicitly separates the indicator (a SNBI) into 'benefit' (psychic service) and 'cost' (disservice) accounts, while adjusting the SNBI with an Ecosystem Health Index. Subsequently, he is also the first author to construct a 'Fisherian Income' index (Lawn 2004b, 2006c). The inclusion of Fisherian Income and the Ecosystem Health Index by Lawn are major technical advances in the literature.

However, in relation to hypothesis four, H4, investigating the historical, technical and institutional details of these indicators reveals that they have many shortcomings. Overall, there is a low degree of innovatory practice. In terms of new and innovative dimensions of the various alternative welfare indicators (ISEW, GPI etc.) only moderate advances are made. The advocates of these measures appear to be *stuck with a restricted set of variables* to conduct their analyses of changes in net welfare. The major conclusion drawn in *Chapter 5* is that the vast majority of net income studies concentrate on accounting techniques rather than solving vital theoretical and technical concerns. They use common-sense operational procedures anchored in a simple plus-minus technique. *Commonsensical ad-hoc accountancy* prevails. Many studies have merely mimicked Daly and Cobb's (1989) techniques for different areas without scrutinising the core theoretical questions. In most cases, they copied the popular commonsensical accounting template without adequate critical analysis of, or improving upon earlier works. In summary, a tendency for the literature to abstract from real trends in the economy is apparent because of the weak apparatus, mechanical applications, and conceptual difficulties. On balance, then, H4 is rejected; it is doubtful that the Net Income Indices in their current form can be (re)developed or enhanced in any significant way.

Furthermore, there are major limitations of the approach to sustainable development as construed by the advocates of SEWIs. They have a tendency to view 'capital' and 'service' as largely autonomous of any *socioeconomic system*. This is the crux of the problem for SEWIs. It is argued in *Chapter 6* that an exploration of the system conditions conducive to service and disservice is needed. A holistic vision of the

system is required to ascertain the destruction and creation of capitals and services. What is needed is a critical analysis of how capitalist relations generate material (and immaterial) dynamics that are anti-ecological, while also potentially engendering new non-capitalist forms of development that are pro-ecological, pro-social and pro-individual. As Paul Burkett (2006:130) states: "Sustainable development needs to be seen as development in, against, and beyond capitalism".

Hypothesis five (H5) will be examined:

H5: Understanding the political economy of capitalism will provide vital insights into Net Income Indices.

Political economy specialises in comprehending the positive and negative forces of the global and regional environment to achieve a holistic vision of how the system functions. A strong historical-institutional apparatus is critical for a proper view of the ecological, evolutionary and socio-political dimensions of global and regional dynamics. No author in the literature has undertaken a critical analysis of Net Income Indices from a political economy perspective. Utilising the principles of political economy, this study embarks on such an analysis.

Chapter 6 develops a fundamental critique of net welfare indicators. The 'multiple capital paradigm' (MCP) is employed to examine some key difficulties in the Net Income Indices. In essence, the MCP recognises that there are heterogeneous durable structures (capital stocks or wealth) that potentially yield services and disservices (see O'Hara 2001a). Capital stocks can provide services in many ways, such as providing friendship, relations of marriage, knowledge, skills, organisational solutions, trust, or beauty. But, SEWI advocates have primarily considered only two forms of capital, artefact (such as consumer goods) and ecological (such as natural resources) capitals. But, they have tarnished other critical forms of wealth, namely, human-health capital and social capital by superficially counting these forms of wealth in their net welfare indicators.[5] Subsequently, it is argued that their conception of capital is simplistic. Their restricted view of wealth inhibits conceptual and empirical analysis. It leads potentially to the destruction of vital forms of wealth because they are abstracted from the analysis.

The disembedded economy is beset with *multiple contradictions*. The notion of contradiction is defined as something endogenous to the system, that is both central to its positive operational dynamics as well as being a necessary negative outcome (see O'Hara 2007a). However, the SEWI advocates focus mainly on the contradiction (i.e. the trade-off)

[5] However, *to some degree* the ISEW/GPI accounts for human capital (e.g. defensive and non-defensive education and health expenditures) and social capital (costs of family breakdown), but only monetary-based measures over time are utilised. Monetary measures fall short of the genuine meaning of durable human structures.

between the natural environment and consumption goods. They are obsessed with the natural environment; yet only handle society to a limited degree. They are stuck in a *one-and-a-half contradiction world*; they see primarily *one* contradiction and a *partial* social reality. Yet, in the global disembedded economy, all areas of life are both relatively autonomous yet interconnected (e.g. Stanfield 1986:ch.4). The creation of markets and new products often occur through the destruction of non-market relations. The crucial contradiction is the negative effect on mutual relationships when consumption rises (markets expand) over time. This is because the market extends to all facets of social life. Life outside of business life (corporations and markets) is dismantled by the incessant transformation and disarrangement of free market capitalism. That is, market transactions increase at the expense of reciprocity and redistribution. Consequently, the so-called 'service' from consumption in the SEWIs is not genuine, because culture and tradition are potentially being destroyed in the process. It is necessary to transcend the 'one-and-a-half contradiction world' and have a broader view of wealth.

An additional hypothesis (H5.1) is, therefore, raised:

H5.1: Multiple contradictions assess the complexity of the disembedded economy better than single contradictions.

There are multiple contradictions of capitalism to be explored, but it is hard to link all of them in one index. While contradictions are relatively autonomous, it is problematical to treat one dialectical contradiction as completely independent of the others. The notion of the disembedded economy is critical to understanding the multiple contradictions of global capitalism, and it links to various problems in all areas of the social economy (H5.1).

There are more complications with the SEWIs, especially when the relationship between the economy and welfare is complex. Complexity prevails because social structures and dominant institutions shape the social filters, which include attitudes, beliefs, judgements, values, habits, and behaviours. Similarly to GDP, the ISEW and related 'net income' measures are composite indicators, and are reliant *only* upon monetary imputations. Yet, monetary measures ignore important social, cultural, family and community contexts (e.g. O'Hara 2001b:93)—as if the 'psychic benefits' would be the same for executives and indigenes, or for mothers and fathers (Salleh 2009:296). In addition, sometimes the actual flow of the disservice is not known with certainty, because of *imperfect information*. Many people are not fully informed about the health implications of a whole range of environmental toxins (see Thomas 2003), such as fluoride (e.g. Bryson 2004) and pesticides (Pimentel *et al.* 2004). Therefore, the validity of the link between price, money, value and

the services/disservices is challenged.

Questions are thus raised about the competence of SEWIs to deal with real-world problems in an environment of uncertainty and lack of information. Drawing on Keynes and post-Keynesian perspectives it is argued that monetary-based net welfare indicators insufficiently explain the problems of 'uncertainty' and 'lack of information'. It is not very meaningful to construct aggregated or composite measures where price is the leading measure of welfare. Utilising monetary estimates would never reliably infer an 'optimal value'. There must be a rejection of welfare economics theory based on optimality. There is imperfect knowledge not only about ecological systems, but also about unexplained phenomena and uncertainty in all forms and aspects of life processes. Hence, net welfare cannot simply be measured purely in monetary terms. It is difficult to manage aspects such as independent and dependent variables, because interdependency is more usual in experiential actuality.[6] On the other hand, contradictions are intended to handle especially the complex workings of the institutions, groups and processes (see O'Hara 2007b). There is a pragmatic advantage in studying multiple contradictions (H5.1).

Additionally, we cannot consider the sum of incomes (services) flowing from commodities as the most important quality. Foremost, we must decipher under what conditions *who* receives the service, because of moral or institutional constraints. That is, one cannot simply consider the service flowing from a commodity without interpreting *distributional* aspects. For instance, there is a potential trade-off between individual and social welfare, where the interests of the individual are satisfied at the expense of societal welfare. Yet, the SEWIs prevent fruitful net welfare analysis of *heterogeneous agents*. The principle of heterogeneous agents states that there are multiple positions and diverse roles in which individuals and species function in the economy (O'Hara 2007a:114-7). For example, the ability of parents to influence the intergenerational transfer of resources to their children is a crucial determinant of the material and cultural advantages they will bring to bear on the future (Bourdieu 1997). High levels of education among the community and key job and economic connections (social linkages) are common for people from families with more control of wealth (Bourdieu and Passeron 1977). Merely summating the income of individuals in an index would therefore trivialise important distributional problems in the market economy.

The sub-hypothesis, H5.2, is also raised:

H5.2: Composite net income indicators inadequately measure distribution.

[6] For example, see Lawson (2006:494) and Resnick and Wolff (2001, 2005) who argue that the social realm is highly interconnected and organic.

H5.2 says that we need to scrutinise the moral and social implications of the generation of services/disservices. This is because resources offered by families, friends and relations necessarily shadow the value of parental guidance, school attendance and occupation. For instance, in Latin America, there are a large number with low-status occupations lacking various types of capital such as education and contacts/networks—i.e. social exclusion is very high (see ECLAC 2007a:ch.3).[7] They are victims of inequity and discrimination because of path-dependent neighbourhood and school segregation influences, which have reinforcing effects since setbacks early in one's career impact throughout one's lifetime (see ECLAC 2007b:17-22,46-8). Hence, welfare may be unevenly distributed amongst people of a particular class, ethnicity and/or gender. The SEWIs are restricted to an impartial measure of these problems.

Often a first mover advantage and cultural modernity are better than the disadvantage of not making the first effort at change. In the global system, such rapid changes leave many nations comparatively backward as they struggle to keep up with the rest of the world. As O'Hara (2006c:xviii) argues, uneven development is thus a necessary part of the motion, whether caused by colonial and imperial dislocation and oppression, the excessive pace of change, the hegemonic rules of the game, geographical and spatial factors, or a lack of social or human capital. Therefore, there are processes at work that help explain the relative success of the 'core' and the 'periphery' and the reinforcement of inequality between them (at many levels). The rate of growth of the core (advanced capitalist) nations tends to promote uneven patterns of income, productivity and quality of life. The periphery lags behind as poverty, lack of human capital and inadequate investment generate underdevelopment. We thus cannot assume future convergence (e.g. between core and periphery) because the world is a complex association of multiple processes including geographical diversity, different histories, asymmetric accumulation of various capabilities, and so on.

There are endemic system problems when only several regions belonging to the periphery grow and develop. For instance, China's growing importance in the global market is aggravating (i.e. disembedding) other social economies in the periphery. The combination of endowments, scale, fast productivity growth and an omnipresent state makes China a formidable competitor to Latin American manufacturers (Jenkins *et al.* 2008:243, Moreira 2007:372). The threat from China is greatest in the most dynamic products but also in those sectors that have proved to be important stepping-stones for industrial development in other countries. It is very difficult for producers in Sub-Saharan Africa

[7] Public financing for tertiary education is highly regressive in all countries in Latin America and the Caribbean (see ECLAC 2007b:28,38-48).

to produce items for higher-margin rapid-response markets because of the weakness of their transport systems (e.g. bureaucratic hold-ups leading to considerable delays) (Kaplinsky and Morris 2008:258,270). China's emergence has thus raised pointed questions about the future of manufacturing in a world market already congested by three generations of Asian Tigers and others, such as India, to come. The implication is that by limiting the inquiry to national or subnational levels, SEWI advocates gloss over the more important regional and global distributional elements of the disembedded system (H5.2).

The real world is complex, but SEWI advocates gloss over the more important regional and global elements of 'human capital'. In general, a healthy, passionate and well-educated person functions relatively smoothly in society since they have high individual capacities realised (i.e. they are in a suitable occupation). This is chiefly because of the high accessibility of well-developed structural capacities. High-quality university institutions, extensive R&D projects and patents are typical characteristics of advanced capitalist economies. They have a superior stock of 'creative-cultural capital' (UNCTAD 2008), but the Asian Drivers are rapidly catching up. In contrast, there is a relatively *low stock of individual and underdeveloped structural capacities* (exacerbated by chronic or prolonged non-extreme poverty) in many poorer countries. Evidence for this hypothesis is there is a substantial brain drain of skilled medical staff from Sub-Saharan Africa to affluent nations (e.g. Canada, US, UK) (see Garrett 2007:15). For example, Zimbabwe trained 1,200 doctors during the 1990s, but only 360 remain in the country today. In Zambia, only 50 of the 600 doctors trained over the last 40 years remain in the country at present. There could be further drain of medical personnel unless domestic training facilities and teachers' salaries expand sufficiently in the developed countries. These examples raise serious questions about the narrow empirical approaches of SEWIs in relation to the wider economy and distribution of human-health capitals (H5.2).

There is a need to transcend the national; the nation is imbedded in the global, regional and local system. Capitalism has a predilection for major technological innovations and rapid penetration of the global system, not just in the national economies. It is revolutionary by its very nature. A dialectic, formulated by competition and innovation facilitates potential growth and development in more geographical areas and nations than previously. As a result, profitable openings irrespective of the confines of a regulatory or cultural environment are unveiled. Only a perspective that examines the global system within a regional and (where relevant) national and local environment is appropriate to finding the roots of social and environmental problems. Thus, I argue that the aggregated national (or subnational) indicators do not get to the heart of solving real issues (vis-à-vis H5, H5.1, and H5.2), because there is an

inadequate understanding of the political economy system. A more detailed and broader approach to sustainable well-being is needed to find the root of social and environmental problems.

Chapter 7 concludes the thesis and summarises each chapter vis-à-vis the hypotheses developed. We make an overall evaluation of the significance of this study for the literature. We conclude that there is a need to go *beyond the veil* of Net Welfare Index construction. Foremost, this study seeks an *understanding* of the political economy of capitalism and of sustainable economic welfare indicators. The promotion of a realistic dialectical analysis is the basis of pragmatic enquiry in political economy. There is a great advantage in exploring the long-term motion of capitalism from a historical-institutional perspective. It provides a way of understanding how we have come to where we are and what we are, and, therefore, how people might be better stewards of the common good (i.e. sustainable welfare). We argue that explaining *why* there might be problems is useful, practical and therefore very important for political economy research.

However, there is much need to develop the analysis—indeed, this study is only a first attempt to solve some of the problems. This study took an 'entry point' and proposed to examine the SEWIs through the lens of political economy, rather than developing a definite alternative. Areas of future research are thus put forward, and much work lies ahead. Obviously, the gamut of contradictions would need to be explored to understand the complex and inherently unstable nature of capitalism. It is hoped that this study will stimulate interest and energise debate in utilising the principles of political economy for the good of the planet and its peoples.

Chapter 2.
Accounting for Income and Welfare: A Historical Overview

2.1 Introduction

A socioeconomic indicator of welfare is supposed to provide a summary measure of the progress or development of the people of a nation. However, there is much controversy as to what is a valid measure. The traditional measure of performance is gross domestic product (GDP). GDP is simply the *gross* monetary total of 'final' goods and services exchanged over time in the home market. The growth rate of GDP per capita is often used to indicate national, regional or global 'economic growth' or the growth in the income, output, or expenditure.

Historically, there is often a positive link between economic growth and welfare, enabling a fuller expression of human individuality and creativity (e.g. UNCTAD 2008:16,51). Part of being a 'free' individual is to express oneself and communicate to others. When communication technology advances, for instance, individuals are able to develop their "selves" more productively with lower transaction costs and thus *potentially* enhance sociality and interactivity. Recent information and computing technology (ICT) advances have provided such avenues for individual development and therefore higher standards of living. The *World Development Indicators* (World Bank 2008) present a trove of such data for aiding our analysis of the 'positives' from economic growth.[8]

Even when the world growth rate of real GDP per capita has been historically low (i.e. 1974–2005 vs. 1950–1973)[9], there has been substantial global communications progress in phone accessibility, with the number of fixed line and mobile phone subscribers (per 100 people) increasing from 6 in 1975 to 69 in 2007. There has been exponential growth in the number of Internet and computer users (per 100 people), rising from 2.5 in 1990 to approximately 38 in 2007. In 2007, the advanced capitalist economies enjoy a superior ICT advantage over all other regions. Newly industrialising countries are quickly catching up, yet Sub-Saharan Africa (SSA) and South Asia lag well behind. For instance, the number of broadband subscribers (per 100) during 2007 in high income OECD nations was 22.6, compared to 0.25 in South Asia and 0.03 (2005) in SSA. However, no *region* suffered reversals over the data periods, and greater access and private ownership of ICT is improving in all areas, albeit at an execrably slow pace in SSA (but there is great

[8] Because of space limitations, the empirical evidence from *The World Bank* (2008) is evaluated in general terms with less specificity.

[9] World growth of real GDP per capita in 1950–1973 was 3.25% compared to 1.45% in 1973–2007 Data are adapted from "The Total Economy Database" (GGDC 2008) and *The World Bank* (2008).

growth potential).

The strong growth in global transportation in freight (and people) exemplifies our fixation on goods and services. All variables (measured in average annual percentage changes) have consistently risen from 1973 to 2006: freight (million ton per km) transported across the globe (7.1%), the number of passengers carried (5.2%) and the number of registered carrier departures (2.9%)—in spite of four major "global" recessions and the escalating international spread of terrorism. Individuals can effortlessly travel by plane to many destinations on Earth, which was much dearer and less possible in the 1950s and 1960s. Travel, for business or leisure, allows one to experience and participate in different cultures.

Resembling the first phase of globalisation between 1870 and 1913, the present phase coincides with a technological revolution in transport and communications that brought about a remarkable lessening in cost and speed time. Culturally, the present existence of large diasporas, the Internet, open-source software, the circulation of video and audio players/recorders/files are also bridging distances and connecting people together once unheard of. The transnational expansion of businesses has also led to cultural exchanges on several levels such as the popularity of Indian movies across the Middle East and Asia, the spread of Ethiopian, Korean and Thai restaurants, Latin music and dance (Palat 2008). Increased trade with China has led to greater prominence for local Chinese communities in Southeast Asia and strengthening of ties between Asia and Africa. At the global level, the system is promoting fantastic *opportunities* for most individuals. The individual is principally freer to travel, be educated, buy and sell commodities without much government or social restriction, and be technologically communicative in the 2000s than the 1970s. This is thanks to *overall* long-term increases in economic growth over real historical time.

The first hypothesis, H1, of this study thereby states that:

H1: Economic growth provides a good measure of wealth and welfare.

Generated by competition and technological innovation, economic growth and the accessibility of credit enable a greater range of opportunities. Economic growth is often a good proxy for welfare. Economic growth offers so many wonderful things, namely, a greater range of commodities and services, the opportunity to travel, work and study, and so on. Individuals can purchase high-performance shoes, cheap digital cameras, quality colour printers and ultra-comfortable furniture and bedding. Many people think that economic growth will give them ever-increasing economic welfare. H1 is topical as most citizens

and leaders have a strong tendency to support growth-orientated policies (e.g. see Rankin 2006:24-7).

A fundamental question, however, arises. What is genuine "economic growth", is it GDP, wealth, income, welfare, production or consumption? It is the purpose of this chapter to examine this question vis-à-vis hypothesis one (H1). Numerous sub-hypotheses are employed to enhance the analysis, which provide specificity to H1. In this chapter, which is divided into five sections, a historical overview of accounting for income and welfare is provided.

Section 2.2 provides a general overview of GDP in the System of National Accounts. This outline of GDP provides the basis for the calculation of (what is commonly known today as) economic growth. *Section 2.3* looks at the earlier judgements of political economists such as Irving Fisher and Simon Kuznets of what constitutes the wealth and welfare of a nation, before the national accounts (in the US) became institutionalised in 1948. The notion of 'service' becomes important. We also critically evaluate GDP from a systems perspective, gaining insight from Marx, Veblen, Keynes and Schumpeter. The main purpose of *Section 2.3* is to give a balanced evaluation of 'economic growth' and 'GDP'. Firstly, it is argued that economic growth was historically understood as the *service*, i.e. as the genuine welfare of society. Secondly, historical trends of GDP provide a good understanding of the workings of the capitalist system. In these ways, we argue that GDP growth is potentially constructive.

However, there are many unresolved problems with GDP. In *Section 2.4*, we discuss the failures of 'economic growth' and GDP to account for various socio-ecological problems, such as conspicuous waste and the destruction of the environment.[10] On the social problems of GDP, such as conspicuous consumption, fashion and the destruction of community, we refer to Veblen, E. J. Mishan and Clive Hamilton. On ecological sustainability, the views of prominent ecological economists, Kenneth Boulding and Herman Daly, are considered. We argue that GDP is problematic when it becomes a single indicator fetish, because of the various problems identified with GDP. We then discuss the advantages and limitations of the greener accounting system, and its usefulness in measuring services. Ultimately, we suggest that *potentially* there is a need to account for the benefits *and* costs of economic growth to formulate a measure of *net welfare* (or net income).

GDP may need to be modified as it provides an inadequate measure of social and environmental waste in the economic system. In *Section 2.5*, it is suggested that an alternative measure, which attempts to solve

[10] The environment represents the integration of living (biotic) and nonliving elements in the environment; and the locus of the entire material support of humanity. It encompasses the physical world and its natural resources, such as water, land, air, and forests; and the environment implicates human interventions and impacts.

some of the inherent problems of GDP, is *possibly* needed. We provide an overview of an indicator that attempts to measure net income, the Index of Sustainable Economic Welfare (ISEW). *Section 2.6* concludes the chapter and provides the overall assessment of H1.

2.2 Gross Domestic Product (GDP)

The traditional measure of economic welfare of the people of a nation has been Gross Domestic Product (GDP) per capita. GDP represents the total output of market economic activity over time. There are three ways of measuring GDP: the income (GDP_I), expenditure (GDP_E) and production (GDP_O) approaches. Each approach utilises different data sources, but in theory they should equate to the same estimate of GDP. Consider, for example, the typical components of GDP from the national statistical agency in Australia. GDP_I summates the incomes accruing from production: compensation of employees (their earnings, wages and salaries plus employers' social contributions); gross operating surplus (profits); gross mixed income (income from unincorporated businesses, including a return to the owners of these businesses for their labour); and taxes less subsidies on production and imports (see ABS 2005b:770). For the expenditure approach, GDP_E involves the adding up of all final expenditures on goods and services (i.e. those goods and services that are not developed any further), summing the contributions of adjustments in inventories and the value of exports minus imports. Finally, the production approach (GDP_O), which is most commonly referred to as GDP, is defined formally by the Australian Bureau of Statistics (ABS) (2005b) as:

> The total value of goods and services produced in Australia after deducting the cost of goods and services used up (intermediate consumption) in the process of production, but before deducting allowances for the consumption of fixed capital (depreciation). [ABS 2005b:770]

In other words, the three approaches equal each other as represented by the following equation,

$$GDP_I = GDP_E = GDP_O \tag{2.1}$$

The importance of this straightforward illustration (in Eq. (2.1)) is to show that GDP, income, expenditure, and the value of goods and services are all interrelated in the System of National Accounts.[11]

[11] As of 1991, GDP has replaced GNP as the preferred measure of the countries product index. Unless stated otherwise, both GDP and GNP will be used interchangeably in this study to mean gross output. The GDP for the United States, for instance, includes the goods and services

Continuing with the example of the ABS, "[t]he essential function of the national accounts is to provide a systematic summary of national economic activity" (ABS 2005a). The statistical agency holds that the performance of the economy can be represented in the national accounts by such measures as growth in GDP:

> [M]ovements in the chain volume of GDP (from which the direct effects of price changes have been removed) are an important indicator of economic growth[.] [However,] there is *no single measure which can describe all aspects of well-being of a country's citizens*. There are significant aspects of the quality of life which cannot be reflected in a system of economic accounts, just as there are significant aspects of an individual's well-being which are not measured in the conventional concept (or any other concept) of that individual's income. Notwithstanding their limitations, especially in relation to *uses for which they were never designed*, the national accounts provide important information for a range of purposes. [ABS 2005b:770, emphases added]

Two closely related points need to be noted from the above-cited passage. The first is that the statistical organisation believes that we cannot rely upon single indices (such as GDP) to represent overall well-being. There are multiple dimensions to life quality, but they hold the view that GDP is a good measure of economic growth. The second message relates to the "uses for which [the national accounts] were never designed". By 'design', they probably mean 'intention', 'structure' and/or 'purpose'. Whatever the actual meaning given here by the prominent statistical organisation, the socio-historicity of this key claim needs to be scrutinised—i.e. we want to gain an understanding of how these statements were constructed.

The following questions are imperative for an understanding of the in-built limitations of the national income accounts, especially vis-à-vis welfare (H1). What are the implications of such a design in the national accounts for income, economic growth and GDP as it has been historically understood? Is GDP an appropriate measure of welfare or economic growth? And, how does the rate of GDP growth, the main indicator of economic growth, relate to welfare? Who uses GDP as a

---

produced by labour and property located in the United States, regardless of nationality. Whereas US GNP includes the goods and services produced by labour and property supplied by US residents. Labour and property either may be located in the United States or abroad—provided they be supplied to U.S. residents. In reality, in the United States (for example) the difference between both the dollar value of the GDP and GNP is small (see BEA 1991), and the same is true also for Australia and other nations who follow the *System of National Accounts*.

general guide to the economic welfare of the nation? How closely does the objective of "economic growth" truly resemble the goal of meeting needs and satisfactions of the society in the national accounts? Does any extension of opportunities facing a person either presented to them through the market or directly by the government always contribute to an increase in welfare? To attempt to respond to these matters, a scrutiny of the concepts of 'income', 'wealth', 'consumption' and 'production' is essential for an understanding of the controversies surrounding GDP and economic growth. We begin with *Section 2.3* below.

2.3 The Historical Significance of GDP

The first sub-hypothesis, H1a, states that:

> H1a: Economic growth or levels of income (GDP) have historically been good concepts for understanding (changes in) net welfare.

H1a is very significant, as the mystery of the link between "economic growth" and 'net welfare' will unfold in the chapter. Here, we discuss the history of what some scholars thought was significant to their nation's income, wealth and welfare. We are especially interested in views expressed *before* the *United Nations System of National Accounts* (UNSNA) was formally institutionalised in 1953 (at the global level). Towards the end of the historical inquiry into net welfare, we will review the implications of H1a.

Before the creation of the SNA (as it is referred to today), inquiry into human socioeconomic performance centred on the recording of various *social* dimensions related to living conditions. Up to the 1800s, in England and France, many political economists were interested in tax reform for which they required national-income estimates. Consider the contributions by Sir William Petty (1623–1687) and Gregory King (1648–1712) in England and Pierre Boisguilbert (1646–1714) and Marshal Vauban (1633–1707) in France. These authors attempted to complete the missing data for their country. Utilising basic methods, they calculated average income, expenses, and consumption of a number of families in occupational or social groups. Boisguilbert was the first to develop the notion of "national income" in France and attempted to develop a rough measure. Many of his concepts of national income closely resembled that of Petty (see Hull 1899). Although a poor statistician in comparison to Vauban, Boisguilbert declared 'consumption', which is a function of money-income, to be the foundation of all wealth. He argued that the world's wealth must be 'consumed'; otherwise, it is useless for society. Both Vauban and Boisguilbert concluded that an inequitable tax system caused many of France's social problems. Consequently, Vauban argued

that yearly records would help tax collection and formulation of policies to foster welfare. Specification of the distribution of national income was sustained during the period of the early 1800s in France and England (e.g. see Studenski 1961).

In the United States, important original works on the distribution of national income and wealth were researched in the late nineteenth century and early twentieth century. One of the major attempts to measure the national wealth was by Charles B. Spahr (1896) in *An Essay on the Present Distribution of Wealth in the United States: America's Working People*. Spahr's income and wealth estimates during the 1880s included services (such as barbershops), labour (i.e. number of paid workers) and physical capital (e.g. residential housing and material goods). His investigation of these economic aspects was more comprehensive than previous works in the US. He gathered material from various sources, e.g. census, private information, and state labour bureaus. After reorganising his estimates by class-size, he found a trend towards greater income inequality (mostly borne by the working classes)—due to regressive taxation. Spahr's empirical work is highly valuable, as it illustrates the significance of *distribution*; but a clearer definition of 'income' and 'wealth' was needed.

Income and wealth are different concepts, and their distinction is important. Hewett (1925:239), for instance, distinguishes between two distinct groups of income: as a flow of services *from* wealth and human beings; and income as a flow of commodities and services (that is, *the wealth itself*; as in Spahr's work). The general practice considered income as a gain above acquisition cost, i.e. the net earnings (also known as net profit). The concept of "net income" most common to accountants, economists and statisticians was (and is) that of 'money income'.[12] According to Fisher (1906:103), a business person's 'money income' means "the money receipts from [their] business, less the money expenses of obtaining them". However, Fisher's concept of income, the 'service' definition, is different from the meaning quite commonly understood as 'income' and should not be confused with the conventional understanding of the term.

In *The Nature of Capital and Income* (1906), Irving Fisher (1867–1947) argued that a proper accounting of 'income' must reflect an *enjoyable flow of services* from capital and human beings. He says that the services are enjoyed in the "stream of consciousness" by a person, during an appropriate time period. Fisher claims that all 'wealth' (or 'capital') bears income, for income consists simply of the services of wealth. Hence, *income* can be defined as the *flow of services* from wealth (capital). Note that, according to Fisher, the service is otherwise known as the 'psychic income', which is a person's desirable satisfaction received from the use

[12] For example, see Bangs (1940).

value of goods.[13] In "The Concept of Income: A Rebuttal", Fisher says that "[a] service rendered by an asset belonging to a given person is an event *desirable* to that person and occurring by means of the asset" (Fisher 1939:359, emphasis added).[14] This implies that the desirability of services is *inherent* in objects of capital. That is, services are *potentially* brought about from the stock of capital. Therefore, for Fisher, the growth of service (or 'income') is the essence of *welfare*, not necessarily the wealth itself.

However, the flow of services need not be positive. There can be disservices, also known as negative income or "psychic outgo". Disservices are best thought of as undesirable after-effects of subjective experiences. They include "[the] ... undesirable events occasioned, or desirable events prevented, by an article of wealth" (Fisher 1906:119). Finally, the summation of the positive and negative flows of income gives the 'net income' of an individual (or economy) through a period, such as a year. In *Equation 2.2* below, "[n]et income is the difference between the value of all the services flowing from an article of wealth through any period and the value of the disservices or costs of the period" (Fisher 1906:121):

$$\begin{aligned} \textit{Net Income} &= \sum (\text{Desirable Benefits} - \text{Undesirable Costs}) \\ &= \sum (\text{Services} - \text{Disservices}) \\ &= \textit{Net Welfare} \end{aligned} \qquad (2.2)$$

The simple identity (*Eq. 2.2*) shows that *net welfare* is the summation of net flows of 'desirable benefits' and 'undesirable costs' as well as 'services' and 'disservices', which is equal to *net income*. Therefore, to gauge the welfare performance of a nation, it would be wise to undertake a comprehensive view of 'income', one that accounts for the benefits and costs of economic activity. Fisher's concept of *net* income (services minus disservices) *possibly* resolves much of this problem. That is, he distinguishes between the "[s]ubjective events which are desirable ... and those that are undesirable" (Fisher 1906:168). The proposition that net income is equated to *net welfare* has much relevance for H1a.

Willford King (1925), 1880–1962, in *The American Economic Review*, for instance, was well aware of the importance of including *household services* in the calculation of net national income. Household or caring labour can potentially contribute to a living environment that is loving, compassionate and secure. For example, the services potentially

[13] Fisher provided no clear guidelines to distinguish between 'psychic income' and 'service'. It is debatable as to whether 'psychic income' and 'service' are synonymous. Does the psychic income potentially emanate from the "enjoyment of the service" or from the "wealth"? We examine these issues and detail the concept of 'psychic income' in *Chapters 3 and 6*.

[14] He defines *capital as a stock of wealth* existing at an instant of time, and the *income as a flow of services* through a period of time (Fisher 1906:52). Fisher considered both 'money income' and 'yield income' important (see Fisher 1939:357).

provided include a functional family from child rearing, sanitation and health from cleanliness, energy and nutrition from meal preparation—as well as many other activities such as counselling and discipline.[15] In "Income and Wealth", King (1925) knew of the potential benefits of household labour to people's welfare; *investing* time in the household potentially produces societal good and enhances human development. Moreover, he was aware that a long-term *reduction* in the number of hours worked in the household was detrimental to socioeconomic welfare. He argued that the large changes over the past century in society were seeing many activities transferred to the market economy—misguidedly, the changes would tend to show up as an *increase* in national income (see King 1925:469-70). He concluded, "[o]n the face of it, therefore, there seems to be no logical reason for excluding an estimate of this sort from the total income of the United States" (King 1925:470).

Reinforcing the need to analyse net welfare (H1a), King (1925) also argued that welfare requires a sufficient level of economic goods, but also adequate public or 'free' goods, such as environmental assets:

> It is easy to fall into the error of assuming that an increase in the supply of economic wealth necessarily means an increase in general welfare. In a country like the United States, however, an increase in the supply of scarce or economic goods has been accompanied by a great diminution in the supply of free goods. Forest and ... grounds [untouched wilderness] have given way to farms and city lots. *By what extent do the losses offset the gains?* [King 1925:470-1]

Overall, King's inquiry analysed the significance of household labour, income, and natural wealth from the standpoint of net national welfare (see also King 1915, 1930).

Prominent economist Simon Kuznets (1901–1985) was also interested in the dialectic of welfare gains and losses in developed and developing economies.[16] He was an authoritative voice on empirical analysis of economic data; engrossed in the relationship between social change, economic growth and income inequality.[17] For example, he included one of the first discussions of the relationship between income distribution and national income (Kuznets 1933:205). To him, the

[15] For a good overview of 'household labour' see Rhoda O'Hara and Phillip O'Hara (2001:457-9) and their list of cited references.

[16] For example, see Kuznets (1955).

[17] Angus Maddison asserted that in comparison to many other comparative growth analysts, Kuznets had an ingenious method of prescriptive policy recommendations and theoretical generalisations (see Maddison 1981:1049).

summary and appraisal notion of national income estimates required an appreciation of the "end goals" and some mechanism for defining and evaluating "net income". Hence, Kuznets argued that striving for a *collective goal of net income* in the national accounts was necessary. His goal centred on the provision of goods and services to citizens *qua* ultimate consumers. That is, similarly to Fisher, he understood that economic growth is a sustained increase of income (*services*) over a long-term trend (e.g. see Kuznets 1947:13, 1948:156,160).

During the early/mid 1940s, Kuznets was a key advisor at the U.S. Department of Commerce on the System of National Accounts, e.g. see *Survey of Current Business*; Gilbert *et al.* (1947, 1948). However, his notion of 'net income' differed from that proposed by the Department of Commerce. Kuznets argued that the goal of economic activity centres on *services to society*, such as the satisfaction of human needs, activities ensuring internal peace, external integrity and familial reproduction (see Kuznets 1947:15). Accordingly, the system of income and product accounts should centre on observing how well economic activity is achieving this welfare-based goal. But the Department of Commerce argued that the system of accounts should focus on monetary exchange (market-based) "production activities".

He did not agree with Gilbert *et al.* (1947, 1948) as the series disregarded the 'service goal' of economic activity.[18] For instance, he was critical of the 1947/1948 Department of Commerce income series, especially of the items in "personal consumption expenditures" that did not contribute to well-being (Kuznets 1948:157). In addition, omitting the services of "housewives" is a large oversight for the national accounts (see Kapuria-Foreman and Perlman 1995:1532). According to Kuznets, the problem with the 1947/1948 series is that application of the accounts were merely designed for "business enterprises and other economic institutions". Therefore, because "the corpus of accounts" are for use in the business world, "many conceptual and classification problems ... in defining national income [in the service sense]" are unresolved (Kuznets 1948:153). In other words, it is difficult to "determine the proper scope of national income and the observable *flows that represent net yields*" (services) in the system of accounts (Kuznets 1948:153, emphasis added). Kuznets essentially argued that the *national accounts overemphasise market production relations rather than household, social welfare and ecology*.

In relation to hypothesis, H1a, in its long history the concept of 'national income' had been understood by Kuznets, Fisher, Spahr, King, Petty, Vauban and others[19] *from a social economics perspective*. We argue

[18] See also Kapuria-Foreman and Perlman (1995), Perlman and Marietta (2005).

[19] For example, the works of Scott Nearing (1915), a socialist economist at the University of Pennsylvania, had constructed estimates of the distribution of income between property owners and labour.

that "economic growth" was historically understood as 'net income'—genuine welfare progress of society—and, therefore, only in this context is H1a acceptable. The path in which "economic growth" was heading was indeed a prolific one, with possible revolutionary positive implications for society. However, because a 'business' worldview was enshrined in the foundation of the system of national accounts, "economic growth" now chiefly signifies market-based production activities.

On the other hand, in practice it is very difficult to make the idea of 'service' (welfare) operational in a system of accounts. The economists and statisticians opted for a measure of prices only, with the inference that higher prices (tend to) signal greater value and therefore welfare. For instance, Fisher wanted to measure changes in the price level as a distinct entity from other factors such as changes in quality. He recognised that the prices of new goods are not directly comparable to the prices of old ones, so some adjustment must be made to the index number formulae. Prices were seen by Fisher as satisfactory for most welfare measurements, but he made no attempt to measure quality (of the service) itself or to adjust for it (see Banzhaf 2001:348).

Imperfect quality differentiation and adjustment are recognised weaknesses of existing National Income and Product Accounts (NIPAs). Quality change and new (disappearing) goods were a continual source of difficulty in this process.[20] Currently, the national accounts selectively apply hedonic quality adjustments only in certain product categories. The U.S. Bureau of Economic Analysis (BEA) and other national statistical agencies frequently rely on proxies for difficult-to-measure service outputs (see Griliches 1992 for discussion). GDP weights outputs (quantities of goods and services) by their prices.[21] This is well known to be far less advantageous than weighting outputs by their overall contribution to welfare (i.e. net surplus, in economic parlance). Prices (and quantities) are used only because they are easy to collect (Banzhaf 2004:611). A physical change in the item can be thought of in terms of quantity. Adjustments for quality, when done at all, amounted to adjustments for quantity. In other words, due to reasons of simplicity (of multiplying prices by their 'physical' quantities) the raw measure of marketed production was born—quite the contrary to that initially envisaged by the great social economists. This makes the sub-hypothesis, H1a, less significant since inescapable practical problems are entrenched in the system of national accounts.

[20] In the U.S. accounts, for instance, GDP counts computers, but because of technological innovation a computer in 1989 is clearly not the same as one in 2009.

[21] Quantities and prices must be measured separately to track real income flows over time, i.e. nominal GDP can be adjusted with an appropriate deflator (and thus removing the direct effects of price changes). If prices and quantities are both allowed to change, a variety of problems arise (known as the "index number problem").

Changing the focus on to 'production' from 'net welfare' was also due to other very important reasons. Fundamental uncertainty and instability were characteristic of the major capitalist economies during the early-to-mid twentieth century, which gave the impetus to develop sophisticated measures of 'production'. Issues of the distribution of income were pushed down the agenda during the "roaring 1920s". The *stability of the economic system* became a principal issue as industrialisation matured and national markets displaced local markets. Naturally, heterodox economists wanted to understand this complex system. For example, Wesley C. Mitchell (1927), in his work at the National Bureau of Economic Research (NBER), was the pioneer of the study of business cycles. He was guided by the theoretical work of Thorstein Veblen who raised the question of the consequences of the domination of the rising industrial system by pecuniary logic and institutions (Mitchell 1947:42,62,65-6). Kuznets was a leader at the NBER in developing quantitative accounts required to probe these problems. As Glen Atkinson (2008:306) argues, the connection of theory and measurement came together in the work of Veblen, Mitchell, and Kuznets, and this was a significant contribution made by institutional economists. Yonay (1998:53-61) observes, it was not quantification for the sake of quantification. *Institutional theory guided the statistical work*.

Traditions, customs and mores of the community and economists of the 1920s–1940s shaped the dominant value judgements of what kinds of 'productive' activities are included in the 'National Income'. With the beginning of World War II in Europe, the concern over an excess of savings turned to the concern over insufficient funds to finance the war effort and the inflationary potential of the war. By 1941, American economists at U.S. Department of Commerce devised the concept of "Gross National Product" to answer such concerns (see Gilbert and Jaszi [1944] 1951:44-5, cited in Atkinson 2008:308-9).[22] Expenditure accounts would be a more effective tool to answer these questions than the existing (money-) income accounts. To wage war, resources would have to be diverted from consumption expenditures to support the war effort. This would also require business enterprises to divert production from civilian goods to military objectives. Thus, according to Gilbert and Jaszi [1944] (1951:46), it was necessary to think of 'total production' as consisting of the output of the private business system *plus* the output of Government. Though the concept of Gross National Product (GNP) was developed for the purpose of war planning, the authors believed it would be useful for *business* planning in peacetime.

[22] Colin G. Clark (1905–1989) was a British economist and statistician who worked in both the United Kingdom and Australia, and who also pioneered the use of the gross national product ("GNP") as the basis for studying national economies. His *Conditions of Economic Progress* (1940) prompted the revival of interest in the causes of differences in economic performance across countries and time.

For the reasons above, it makes sense that we need to start with GNP growth for comprehending the dynamics of capitalism. GNP or GDP is simply equal to 'consumption demand', plus 'investment demand', government expenditures and net export demand. According to François Lequiller (2005), Gross Domestic Product is defined as the sum of all goods and services produced in a country over time, without double counting products used in other output. The letter P stands for "Product", the result of production. GDP is a comprehensive measure, covering the *production* of consumer goods and services, even government services, and investment goods. GDP flow is in effect a raw measure of the production and (in part) consumption of marketed commodities and services.

A limitation of GDP is that it does not differentiate between creation of genuine service *and* 'consumption' (as the literal destruction of specific capitals). We cannot directly tell the degree of destruction (e.g. of the natural environment) over time from 'GDP growth'. The measure is far from perfect and probably needs to be supplemented or modified to some extent (as discussed below in the next sections). Still, a comparative analysis of the changes in real GDP growth per capita *is* useful for comprehending the expansion of market relationships. Real GDP is a measure of quantity, in which prices are held constant over time. When prices are held constant, movements in the output index tellingly describe changes in quantity produced and consumed. A faster rate of GDP growth over time is equivalent to 'more market-based production' over time, and the reverse is true (a slower rate leads to less production). In the global capitalist system, distribution of GDP levels or growth rates are thus significant to an area that has more market-based creation over real historical time.

Hypothesis, H1b, thereby states:

H1b: Historical trends in GDP provide a good understanding of the workings of the capitalist system.

According to the U.S. Bureau of Economic Analysis (BEA), "the basic criterion used for distinguishing an activity as economic production is whether it is reflected in the *sales and purchase* transactions of a market economy" (Eisner 1988:1612, emphasis added). All potentially marketable activities are considered "production activities". The fluctuations of the growth rate of real GDP per capita can give an indication of system abnormalities. In this single number, we acquire an idea of whether the economy is expanding or contracting. In this context, long-run historical trends in GDP provide a good understanding of the workings of the capitalist system (H1b).

As understood by Marx (1818–1883), Veblen (1857–1929), Keynes

(1883–1946) and Schumpeter (1883–1950), capitalism is revolutionary by its very nature—a dialectic, formulated by competition and innovation, facilitates potential growth and development in more geographical areas and nations than previously. As a result, profitable openings irrespective of confines of a regulatory or cultural environment are unveiled. Capitalism's "universalising tendency", technologically and geographically, radically distinguishes it from all previous societies (Foster 1999). But as periodic instability, conflict and disarray are natural to capitalism, the costs (disservice) of this process for capital and society can be large. That is, the system has a positive and negative side, where service is reproduced along with disservice. The analytical works of Veblen, for example, examined the complex mechanisms responsible for the development (and stagnation) of productive forces, *and* the rise and decay of social and ecological organisations. In short, the four greatest economic minds of all time realised that there is a positive and negative side to economic growth ('GDP growth') under capitalism.[23]

In the *Grundrisse* (1857-58), Marx emphasises the destructive and creative propensities of capitalism—the negative and positive essence of capital. Capitalism, he argues, destroys the old pre-capitalist way of life, "and constantly revolutionizes it, tearing down all the barriers which hem in the development of the forces of production, the expansion of needs, the all-sided development of production, and the exploitation and exchange of natural and mental forces" (Marx 1857-58:410). The "constant revolutionising of production" entails creation that spells the obsolescence and consequent destruction of any industrial structure of society's production that exists at any moment (cited in Elliot 1980:47). In *Capital*, he also wrote of bringing development of the forces of production and the world market "to a certain degree of perfection" as capitalism's "historical mission" (Marx 1909:522) and developed reproduction schemas as a means for systematically outlining the capitalist growth process of destruction-creation (Marx 1867:chs.20-1).

The great "historic quality" of capital is to create surplus labour (labour in excess of that necessary for subsistence) and thereby surplus value, investment, *and economic growth* (Elliot 1978-79:150,153). In Marxian terminology, the flow of production is equivalent to the income or production approach to GDP found in the SNA. For the economy as a whole, the aggregate value of output is the sum of constant capital (value of depreciation charges, raw materials and fixed means of production used up in an accounting period), variable capital (all wage payments) and surplus (total profits, interest and rents) (Klein 1969:158).[24] (In the

[23] We do not discuss separately Veblen's contribution vis-à-vis H1b here, even though it is relevant. The reason is that his works are more significant to the overall hypothesis one (H1), and subsequently require more detail. In *Section 2.4*, we look at his works linking the system to conspicuous consumption, waste and leisure.

[24] This assumes that values are equal to prices and thus eliminates the 'transformation problem'.

Australian SNA, for example, GDP_I includes the "gross operating surplus", i.e. profit.) These Marxian aggregates are divided into two sectors of the producers' goods and the consumers' goods, which serve to illustrate the nature of interdependence among the various categories in the circuit of social capital of the capitalist economy (Tsuru 1969:198). Concerning 'GDP growth' (H1b), Marx studied various aspects of the gross national income well before the formalisation of the UNSNA.

In *Capital* (Volume I, III), he examined the role of industrial and financial profits and capitalist investment through an analysis of the reserve army of labour, the distribution of income between workers and capitalists and the nature of technological change. Marx was also interested in the time it takes a commodity to realise its value through sale—known as the 'turnover time of capital'. A faster turnover time is a key system requirement for sustaining long-term capital accumulation because it exerts upward pressure on the rate of profit (surplus value divided by constant plus variable capital). The 'turnover time of capital' is comparable with the *effective demand function* of GDP growth, since the activities in the sphere of circulation indicate sales and purchase transactions. But the separation of buying and selling provides the potential for a crisis as the sphere of circulation may temporarily seek to surpass the limits of production, thus generating excess fictitious capital and prices out of line with fundamental values (see Kettell 2006:26-39). There are thus contradictions within the sphere of circulation (and elsewhere in the competitive market-system).

Marx said that the major contradiction of capitalism lies in the incessant global drive to accumulation and profitability while the social fabric is subject to instability and destruction (O'Hara 2006d:3). Crises and recessions are thus endogenous to the system, because the expansionary paths of the cycle set in motion processes that eventually reduce profit rates. The very nature of a downturn in the economy would manifest in a declining circulation time of capital-goods, stagnating wages (less profits to pay the workers) and hence limiting production (output), distribution and consumption-demand (Sherman 2003:622). Industrial investment soon falls when the profit rate declines and the economy moves into recession, as would be indicative of low (or negative) real growth rates of GDP per capita. This is because profits are the crucial factor determining production and investment in expansion and in contraction of production. Long-term historical trends in GDP growth are thus a good proxy of how effective the system is working to accumulate capital and make sufficient profit (H1b).

In a similar vein, Keynes also understood that the relationship between investment and effective demand is dynamic. In *The General Theory* (1936), he was concerned about the effects of consumer durable goods on household spending and saving behaviour, and the

macroeconomic effects of a build-up of durables. The situation and effects are similar to spending on business durable equipment (Keynes 1936:98-106). Consumers tend to stock up on durable household goods in boom times. For example, the relatively prosperous 1920s was a period of rapid accumulation of houses and other consumer durables as well as durable fixed capital equipment. Then for a mixture of reasons (pessimism, satiation, etc.) consumers make their existing stock last a while longer. There would be dislocation in the economy if consumers simply shift their spending from durable goods to non-durable goods and services; and firms that produce or sell durable goods are harmed (Atkinson 2008:313). However, the overall economy may adjust relatively quickly. Alternatively, if households decide to save the money not spent on durables, then a downward spiral of the 'multiplier process' would be evident (such as during the Great Depression). To the extent that the stock of these goods allowed consumers and investors to postpone spending, there was a drag on production and income (i.e. output growth).

But the critical argument of Keynes is that the level of output (i.e. GDPo) and employment *as a whole* depend on the amount (quantity) of investment, *given the social-psychological level of uncertainty*. Since private profit is the goal of capitalist institutions of enterprise, the basis of strategic investment decisions is linked to the state of expectations about the prospective (future) yields of capital assets. The expectation of profit motivates investment (as well as present and past profits) providing the funds to invest or the assets on which to borrow for investment. Expectations are based on subjective probabilities (e.g. perceived risk) and confidence. However, uncertainty is different from risk in that the investor does not always have a high confidence in these subjective probabilities and cannot easily calculate them. The world is fundamentally uncertain in the sense that we know nothing of the future, yet we are required to plan different courses of action for the life process (Keynes 1937:216-7).

Keynes said that investors pay close attention to the state of confidence (such as in lending institutions and ratings agencies of private-sector securities) because it helps to determine the decision to invest. But as the global credit crunch of the late 2000s reveals, the institutional arrangement is not capable of endorsing a stable environment for more certain decision-making. In Keynes' system, the clue to crises is found in variations of the inducement to invest, which depends primarily upon the prospect of future profit from new investment—but "the actual character of which we know nothing" (Keynes 1937:214). In relation to sub-hypothesis H1b, Keynes highlights the usefulness of output growth to understanding the system: changes in the level of uncertainty lead to changes in investment demand, which in

turn affects aggregate output.

That the capitalist process is marked by *endogenous change* was also articulated in Schumpeter's *The Theory of Economic Development* (1911) and *Capitalism, Socialism and Democracy* (1943). The evolutionary dynamic of capitalist development has three striking characteristics: It comes from *within* the economic system and is not merely an adaptation to exogenous changes. It occurs *discontinuously* rather than smoothly. It brings *qualitative* changes or "revolutions", which fundamentally displace old and create radically new conditions. In relation to sub-hypothesis H1b, economic development is accompanied by output growth, i.e. sustained increases in national income. But basic quantitative growth does not constitute development by itself. "Add successively as many mail coaches as you please, you will never get a railway thereby" (Schumpeter 1911:64). The immediate stimulus to development emanating in the system is "innovation". There are five main types of innovations that can bring about growth and development: process and product innovation, new origins of raw materials, new market openings, and changes in industrial organisation (Schumpeter 1911:63-6). Single entrepreneurs, small business groups or large corporations can activate these combinations of factors in new processes and outputs. The principal benefit society gets from market organisation of economic activity and competition is innovation and economic progress—this is the positive side of capitalism.

But the positives are inextricably linked to the negatives. The innovational process "incessantly revolutionizes the economic structure *from within*, incessantly destroying the old one, incessantly creating a new one. This process of Creative Destruction is the essential fact about capitalism" (Schumpeter 1943:83). The formation of few barriers to entry can cause dynamically competitive markets, and this competition will make high degrees of innovation out of pure necessity for firm survival (e.g. Cantwell and Santangelo 2000:134). The competitive accumulation process can lessen the super-profits that spur entrepreneurial action. An inability to create new products, processes, sources of raw material, reorganisations and markets will drive some firms out of the market (Schumpeter 1943:84-5). The recent multinational corporation, a product of capitalist development and technology, renders the economic and social position of the small-scale, competitive firm and its associated small bourgeoisie increasingly obsolete. Thus, there are fundamental uncertainties involved in innovation under capitalism because of the inability of economic actors to see perfectly the best things to be doing.

Innovations that are carried out require the monetary creation of purchasing power by the banking system (Schumpeter 1911:69-70). Since entrepreneurs, backed by bank credit, appear in groups or clusters, capitalist growth and development exhibits a cyclical pattern.

Schumpeter (1939:Volume 1, 169-70) utilised Kitchin (3–5 years), Juglar (7–11 years) and Kondratieff (40–60 years) cycles in his empirico-historical analyses. Entrepreneurial action gives way to the "prosperity" phase, in which innovations emerge, and the "recession" phase, a lapse of time during which the system adapts to 'creative destruction'. Fluctuations in economic activity are thus seen as endogenous over the cycle because each phase of the cycle determines the next phase, e.g. crises are caused by the trends that occur during the expansion of capitalism.

Summing up, in addition to Marx, Veblen, and Keynes, Schumpeter also saw the economic system as being potentially unstable, with recession (or depression) as likely as sustained periods of output growth.[25] Marx, no less than Schumpeter, perceived capital accumulation as occurring irregularly, in bursts, with cyclical consequences (Marx 1867:672,693-941). Output (i.e. GDPo) growth must therefore be scrutinised in the context of the cyclical movements and long waves by having a detailed historical analysis (H1b). Indeed, the concept of GDP has aided our understanding of the Great Depression in particular and business cycles in general. Capitalist institutions include production only for market exchange, a monetary economy, and production motivated mainly by profit. All of these institutions make possible the business cycle—because if there is insufficient monetary demand to buy the supply at a price including a profit a contraction may occur. As Howard Sherman said in *The Business Cycle* (1991), "GNP is the broadest aggregate variable, so it normally reflects the business cycle, moves smoothly upward in the expansion and smoothly downward in the contraction, and neither leads nor lags" (Sherman 1991:13).

In conclusion, the task of political economy is to continue exploring the modus operandi of capitalism with a view to ascertaining the changing forms in which the system manifests itself. The growth rate of GDP in a historical context is relatively good at both depicting the stage of the business cycle and any effective demand problems emanating within the system. Victor Lippit (1992) noted,

> [G]ross national product (GNP) excludes housework, do-it-yourself projects and indeed all productive activities that are not associated with markets, materially understating a nation's production of goods and services ... and so forth. Despite these shortcomings, however, the national income accounts provide valuable information concerning the functioning of national economies ... that are not otherwise gained. [Lippit 1992:81-2]

[25] Veblen is discussed further below.

In other words, GDP has many limitations, but the usefulness of the indicator is in its efficacious understanding of the dynamics of the business cycle. In this context, we argue that sub-hypothesis H1b can be accepted: GDP is charged with significance because it aids our understanding of the capitalist system. However, the "shortcomings" of GDP growth make it a weak indicator of net welfare. That is, there are many unresolved socio-ecological problems of GDP, which we now turn to in the next section.

2.4 Unresolved Socio-Ecological Problems of GDP

Section 2.4 critically evaluates the socio-ecological problems of GDP, linking the analysis with hypothesis one (H1) that "economic growth provides a good measure of wealth and welfare". Note the problems of GDP are simultaneously social *and* environmental. For example, step-families resulting from divorce and remarriage create complicated intergenerational relationships, as well as putting added pressures on the natural environment (e.g. two sets of clothing, toys and the like are often required when children are living in two households). In another case in point, the existence of the private motor car encourages the geographical dispersion of housing, shops, entertainment, and a variety of consumer "services", which in turn increases the indispensability of the private automobile. This can foster a long-term economic dependence on the motor vehicle industry and the various implications that follow from this (e.g. air and noise pollution, congestion). The path of radical innovation is obstructed when it threatens profitability and further growth of the automobile industry, since barriers to entry are relatively low (due to its oligopolistic basis). Because of a high degree of interdependence between social and ecological spheres, the analysis of the problems of GDP is somewhat complicated.

In order to study the problem in some detail, social and environmental problems of GDP will be treated as relatively autonomous (yet we recognise that the spheres are interdependent). Two critical sub-hypotheses will guide the analysis: the first sub-hypothesis, H1c, deals with aspects that are more social; and the second sub-hypothesis, H1d, especially deals with ecological sustainability. As in hypothesis H1c(i,ii,iii), a significant difficulty relates to the theoretical and practical nature of 'consumption' in GDP:

H1c: The operation of GDP concepts in practice generates problems, especially in relation to consumption:

(i) Conspicuous consumption, waste and fashion are not specifically identified in GDP accounting.

(ii) An abundance of choice of marketed goods and services (GDP) can negate sociality, community, family, and therefore

social welfare by promoting individualism.

(iii) GDP excludes the durability of artefact capital.

We begin the analysis of H1c in view of Veblen, who recognised that "ecological problems are social problems" (Boles 1998:155). Veblen was a real pioneer in environmental sociology; albeit, he is not that well known in the literature. Here, we examine some of his major works and put them into the context of H1c(i). We look at Veblen's critical analysis of land expropriation by absentee owners, wasteful natural resource extraction, and rapid deterioration of the productive land base.

Veblen was a critical theorist of conspicuous consumption and wasteful extractive processes of natural resources. One of the main consequences of capitalism has been the transformation of consumption and waste into an endeavour to be respected. Consumption becomes a defining feature of any culture under corporate capitalism, when it is pursued for itself with all the waste that it encompasses. Ross Mitchell (2001) argues that the strength of Veblen's analysis is in the contradiction between the capitalist system, devoted to predatory, pecuniary ends, and the required *engineering or technology* to transform raw materials into consumable goods, or production of use values (the 'service').

As detailed in *The Theory of the Leisure Class*, Veblen (1899) believed that social development sprang from the growth of technical knowledge and the use of tools. There was an emerging elementary distinction between two classes of persons: the *industrious class* (or workers) and the *predatory class* (the pecuniary or business class). Workers, engineers, and technicians produce the actual wealth (the useful potentially service-giving goods) of modern society. Industry was thus viewed as the production of useful wealth, and business as the accumulation of profit. In contrast, the predatory class is fabricated from "parasitic" business members living off the innovation and productiveness of the rest of society. Veblen stressed that such persons do not produce anything of service to the welfare of society—i.e. they generate disservice. In its place, they rely on competitive manipulations to gain their own personal wealth and impede the coordinated operation of an advanced industrial society. According to Veblen, the two classes are further distinguished: the industrious class comprises the mass of society's population, while the predatory class forms a small-in-number, privileged, upper-class segment including business owners, politicians, lawyers, accountants, and managers.

Veblen's (1899:99) expenditure test of "goodness" (the 'service') is "whether it serves directly to enhance human life on the whole—whether it furthers the life process". However, Veblen considered two types of non-service ('disservice') bearing activities. He asserted that the

conspicuous consumption of artefact capital is held to be a symbol of high status that exemplifies the upper, predatory class. He related 'conspicuous leisure' to those who spend their time working not productively or yielding no service to society. 'Conspicuous waste' was considered a blend of conspicuous consumption and conspicuous leisure. He argued that domination by the upper, predatory classes is sustained when consumption is envied and emulated by other classes. These wasteful behaviours demonstrate an incompetence in stimulating a healthy and equitable economic output for all community members to share.

By waste, in *The Theory of Leisure Class*, Veblen (1899) was not alluding to pollution and refuse generated from industry and other human activities, since economic inefficiencies and societal consumption patterns may also be negative externalities (to some degree). However, there is much significance in Veblen's work of natural resource exploitation in *Absentee Ownership and Business Enterprise in Recent Times: The Case of America*, in which he intelligently positioned environment and society. In several chapters, Veblen (1923) provides an insightful explanation of all that he found erroneous with the American economic system. Both hypotheses, H1 and H1c(i), apply to the uses of property "that were speculative, unproductive, wasteful, and/or exploitative".[26]

Veblen (1923:119) maintained that "absentee ownership has become the master institution in American civilisation". Such absentee ownership was founded not by virtue of workmanship "but on the ancient feudalistic ground of privilege and prescriptive tenure, vested interest, which runs back to the right of seizure by force and collusion" (Veblen 1923:51). The problem of absentee ownership is people who did not rightfully own the land exploited natural and human resources (or land, capital, and labour) *for financial gain*. He was indignant that the plentiful natural and public resources of the nation were being calculatingly wasted on the opportunistic principles of "sound business" as laid out in the American plan. For example,

> [Absentee ownership] is not particularly American, except in the sense that it has been worked out more consistently and more extensively here than elsewhere, and that it has been worked into the texture of American life and culture more faithfully. ... This American plan or policy is very simply a settled practice of converting all public wealth to private gain on a plan of legalised seizure. [Veblen 1923:168]

[26] See Vaughn (1999:716). On natural resources, see Veblen (1923:119-201) in "The Case of America", and the subchapters, "The Independent Farmer", The Country Town", The New Gold", and "The Timber Lands and The Oil Fields". These references are cited in Mitchell (2001).

In the chapter entitled "The Timber Lands and the Oil Fields", Veblen (1923:186-201) delineated the historical development of the lumber industry to illustrate "how absentee ownership functions in taking over the country's natural resources and uses them up" (Veblen 1923:187). The destruction of the eastern and Midwest forests of America in the quest of net gain by "enterprising" lumbermen was criticised by Veblen. As he depicted it, most of the evergreens east of the plains (i.e. cedar, spruce pine, and hemlock) were "run through and virtually exhausted during the latter half of the nineteenth century" (Veblen 1923:188). He considered the production of lumber more than any other natural resource typified "how absentee ownership functions in taking over the county's natural resources and using them up" (Veblen 1923:187).

Referring to his small-scale farming and forestry experience, Veblen was an early advocate of sound forestry stewardship (Mitchell 2001:396). He affirmed the justification for a sensible utilisation of forest resources. In particular, he spoke against uneconomical use of forests using "dubious practices ... [which] carr[y] through the cost of the community at large" (Veblen 1923:189). Veblen (1923) wrote that what transpired with the case of America's timberlands similarly applied to other natural resources; "these others, too, show the characteristic traits of the American plan—initial waste and eventual absentee ownership on a large scale and on a quasi-monopolistic footing" (Veblen 1923:194). Veblen (1923:129-165) also described the predicament of American farmers as being manipulated by "background vested interests". Veblen's principal criticism of farmers was their often wasteful agricultural practices to satisfy pecuniary interests. Modern farmers were wedged between merchants who paid them little for their agricultural produce but sold to unsuspecting consumers at inflated prices. According to Veblen,

> [T]he margin of benefit that comes to [the modern farmer] from his work is commonly at a minimum. He is commonly driven by circumstances over which he has no control, the *circumstances being made by that system of absentee ownership*. [Veblen 1923:130, emphasis added]

In other words, Veblen (1923:124) viewed natural resources as having to serve some productive end useful to society; however, he spoke against the "American Plan of seizure and conversion ... [and] of hurried exploitation instead of economical use [of the service]" (1923:186-8).

In summary, Veblen's critical discourse on conspicuous waste, leisure, and consumption as immaterial status symbols, and of resource scarcity caused by corporate and state wastefulness is relevant in today's rapid environmental and socioeconomic change. The significance of

Veblen's (1923) *Absentee Ownership and Business Enterprise* is shown by Schnaiberg and Gould (1994:60), who state that "firms are increasingly owned by 'absentee' investors: actors who neither live in nor particularly care about the community in which the firm is located". Mitchell (2001:392) believes that Veblen's treatment of a consumer-orientated society entrenched in reckless waste by product-hungry corporations underpins the root causes of environmental ruin and pollution.

Therefore, with respect to hypothesis one (H1), the extent to which conspicuous waste comprises GDPE, economic growth is not a good measure of additions to welfare (in the service sense). Economic growth is also a poor measure of real welfare progress (H1), when "converting all public wealth to private gain" (Veblen 1923:168) under a system of absentee ownership. On the other hand, economic growth is probably a good proxy for the growth in conspicuous waste, because the social preference of Veblen goods is largely reflected in the 'personal consumption expenditure' item of GDPE. In practice, then, GDPE is a *possibly* a good proxy of conspicuous waste. However, conspicuous waste is *theoretically* loose in GDPE. Thus, H1c(i) is the more appropriate conclusion: that conspicuous consumption and waste are not specifically identified in GDP.

Fashion is another item not that well structured in GDP accounting (H1c(i)). Striving to be fashionable relates to the perceived well-being derived from the variety of choice in consumer goods. The basic assumption of so-called 'consumer sovereignty' in a capitalist culture is to vindicate that a reduction (or rise) in economic growth contributes to a diminution (or enlargement) of social welfare. Namely, any lessening (or expansion) in the range of opportunities contributes to a diminution (or enlargement) of social welfare. This means that one of the fundamental assumptions is that human welfare is positively linked to GDP growth and the range of opportunities and choices that it brings. However, it should not be too difficult to reveal flaws in the assumption of a positive correlation between GDP growth and real welfare progress beyond "essential consumption" (H1). We primarily examine two commentaries on the relationship between economic growth and social malaise: E. J. Mishan's (1967) *The Costs of Economic Growth*; and Clive Hamilton's (2003) *Growth Fetish*. These popular works are significant, because the authors have scrutinised problems associated with the expansion of *choice* in consumer goods.[27]

In an affluent and growing economic system, the market is a *wants-*

[27] Mishan and Hamilton's accounts are interesting, as both are devastating critiques of economic growth. Hamilton is critical of the costs of growth experienced since the Second World War, but principally since the 1970s to the present; whereas Mishan does not think too happily of the growth experienced in the 1950s and 1960s, *let alone* a century or two ago (Mishan 1967:175). Mutually, they have revealed a clear connection between the symptoms of social malaise and the processes that are generated by economic growth.

creating mechanism rather than a wants-satisfying mechanism. A wants-creating mechanism is where a creation of new dissatisfactions is made to ascend from old satisfactions.[28] The market system endeavours to elevate the fashionable and deride the trendy idlers. Mishan (1967:150) argues that the economic order is accommodating itself to an "indigestible flow of consumer gadgetry by converting the rationale of its existence: 'scarce wants' have somehow to be created and brought into relation with rising industrial capacity". Hamilton (2003:ch.4) adds that the *marketing system* has one of the most important roles in influencing one's identity. Consumers, according to Hamilton (2003:65), have *less* choice because the corporations manipulate consumer behaviour, which in turn helps people derive their identities from what they consume. This is at odds with persons understanding what is in their real or social interests. It is economic growth and the omnipresent influence of modern technologies and advertising that have become imbedded in the culture of our society.

Therefore in relation to hypothesis one (H1), the extent to which consumption of fashion goods comprise GDP$_E$, economic growth is not a good measure of the *genuine* satisfaction (psychic service) experienced. The problem is that we do not know the level of fashionable goods purchased in the 'personal consumption expenditure' item of GDP$_E$—and thereby it is difficult to ascertain its net welfare effects on society. Similarly to conspicuous consumption and waste, fashion is not specifically identified in GDP$_E$ accounting; this is sub-hypothesis, H1c(i). But in practice, a substantial fraction of GDP$_E$ involves these types of consumption, as the *wants-creating mechanism* and the *marketing system* dominate consumer culture (à la Mishan and Hamilton). In this case, H1 is problematic: economic growth, especially as growth in GDP$_E$ per capita, is not a very good measure of net welfare.

Real GDP growth is a good indicator of the quantity of *marketed* goods and "services" purchased, but problematic as a measure of net welfare. Simply, economic output is not the real source of social welfare. The critical point developed by Mishan and Hamilton is that social welfare is ultimately rooted in people's closeness to each other and the degree to which they live in *community*. However, the organised pursuit and realisation of markets based on absentee ownership inhibits a fruitful community. Mishan in *The Costs of Economic Growth* proficiently summarises the missing link between welfare and GDP growth:

> The frantic self-seeking for material achievement, being the most glaring social characteristic of those countries that have benefited most from the advance of science ... is abundant to the point of embarrassment. ... It is not so

[28] The corporations, the consuming public, and the state facilitate this complex process.

> much that feeling is 'drying up' within us, but that with so much of it being channelled into the aptly-called 'rat-race'—into the pursuit of material success, into the pursuit of new knowledge, into the pursuit of fashion, prestige pastimes, and new sensations[29]—*little is left to flow directly between people*. [As] ... the ... flow of [relationships] between people [deteriorates] the more impatient a man may be to seek immediate relief in the external world of glamour and fashion—a world wherein other people play an incidental role in his schemes of personal triumph, but otherwise do not matter to him. ... [A]n open, easy and full hearted relationship with one's fellows, for instance, is not something that can be bought or contrived or willed into being. The *indispensable ingredient of such a relationship is mutual trust*, a quality nurtured in a small agrarian society based on mutual dependence, and one of the first casualties in any society whose energies are drawn into the competitive scramble for material ends. [Mishan 1967:189,210, emphases added]

This is why H1c(ii) is significant: that an abundance of choice of consumer goods (GDP) negates sociality, community and family, that is, the various forms of social, cultural and familial–communal capitals are being degraded over real historical time.

Many empirical studies confirm the strong falls in 'social capital' such as trust and community from increased individualism and the profusion of conspicuous goods, especially in US (see O'Hara 2006c:ch.9). Robert Putnam (2000) describes the declining trend to a recipe of reduced voter turnout, lower trust in government, less church attendance, a smaller interest in participating in public meetings, declining union membership, reduced membership of parent–teacher associations, fewer volunteers for non-profit activities, and a disinclination of people to join clubs such as bowling associations. There is less civic engagement, and dwindling space for civil society. Evidently, not all types of associations are equally beneficial in promoting trust. Pamela Paxton (2007) found that at the country-level, a high level of *isolated* associations is indicative of the presence of many unconnected groups. A large number of unconnected associations in a country would therefore suggest a lack of common norms and/or common feeling across society.

Global capitalism's quest for rapid GDP growth and migration, principally from rural to urban areas has been a contributing factor to the

[29] See also Mishan in *Pornography, Psychedelics and Technology, Essays on the Limits to Freedom* (1980).

decreasing importance of community and the extended family.[30] It is becoming increasingly difficult for many developing countries to maintain the current forms of informal long-term care arrangements, especially for older persons because of the lack of availability of institutional care—formal support systems remain limited. Informal protection mechanisms (largely based on family support) have been under increasing stress recently, owing not only to such factors as demographic trends, greater female labour participation and higher economic risks for families, *but also to shifts in paradigms of filial support and reciprocity* (Gomes da Conceição and Montes de Oca Zavala 2004:246).

On the other hand, it is important to note the counteracting forces to welfare damage from GDP growth that *can* have a positive impact on 'cultural capital'. That is, the historical institutional arrangement *may* promote sociality and community that *to a degree* offsets the destruction of non-market relations from GDP growth. Hypotheses H1 and H1c(ii) must be seen in light of the dominant economic, social, cultural and moral institutional structures. For example, according to data from the World Values Survey over 1981, 1990, 1995, 1999–2001, Nordic countries featured a comparatively high trusting environment, and the proportion of that trust has been increasing.[31] The area has been relatively shielded from the global onslaught of neoliberalism; Scandinavian countries are renowned for their universalism stance on the share of social wealth, developed welfare-state and strong participatory culture of local and central governments. Campbell and Pedersen (2008:317) argue the policies that set apart the Nordic approach to "regulating capitalism" are motivated by egalitarianism rather than resistance to market-driven economic restructuring. High levels of trust and educational achievement at the lower end of the skill hierarchy have made it possible to achieve significant productivity growth across a wide range of public as well as private services.

But generally, at the global level, there is simply not enough familial stability, trust, community and sociality for the provision of positive services and public goods such as stability and relative equality. For instance, being 'constantly connected' means more work for many and

[30] Economic insecurity has put pressure on young and able family members to increase their participation in wage-earning activities outside the home, including through migration (to domestic and international destinations) (Aboderin 2004).

[31] We can roughly describe the quality of relationships of society (in general) by observing qualitative changes or average levels in 'trust' over real historical time. The unweighted average percentage of respondents who said that 'most people can be trusted' during 1981–2001 for Nordic countries (Finland, Norway, Netherlands, and Sweden) was 57%. This is high in comparison to an average trust of 39% during the same period in the neoliberal capitalists (Austria, Australia, Belgium, Great Britain, Iceland, Ireland, Northern Ireland, Switzerland, US, and West Germany). From 1981 to 1999–2001, trust in the Nordic countries increased by 24.2% compared to a decline of 11.7% in the neoliberal capitalists. *Source*: Data adapted from various 'Waves' (1981, 1990, 1995, and 1999–2001) of the World Values Survey Database (2006).

less time with the family (see Cheng 2007). Contrary to blissful advertisements suggesting that people can do more in less time, the evidence suggests that people simply *do more, more of the time*. Doubts are raised about the extent to which ICT brings about real individual freedom and social welfare. This is an interesting quandary because we introduced the chapter by hypothesising that 'economic growth' *may be* a relatively good measure of wealth and welfare (H1).[32] Yet, we did not specify any distinction (that may arise from GDP growth) between 'individual' or 'social' welfare. A part of the response is that there needs to be a good balance between individual and social interests.

A person should be able to make decisions freely to utilise their gifts (capabilities), develop their character, and pursue material autonomy to create, play and have fun with things. Potentially, these are all good things that economic growth can provide, and the elements of material creation are typically captured in 'GDP'. Reduced liberty can hinder a person's creative pursuits and retard business innovation, which, for example, is apparent in Sub-Saharan Africa because of insufficient long-term regional GDP growth. But, too much 'freedom' is problematic if it is twisting goodness, life and love (especially).

Love is a relational and continual activity, where the *deepest* needs and longings of persons in the community are being met. One way of loving someone better is to spend quality time with them through 'connected knowing', someone who is forging their identity from the relationships with others, i.e. deeply learning from others' experiences (see Fincher 2007:118-22). A fine place for the cultivation of real agapē (self-sacrificial or 'unconditional' love) is in marriage relationships—*but enhanced especially by love that is being encouraged by persons-in-the-community seeking things that are honest, good, and lovely*. In other words, self-sacrificial love in the community is often reflected back into a loving durable relationship and vice versa (Clark 2006:264-5).

However, as the system motivates individuals in what Doug Brown (2004) calls their *Be-All-They-Can-Be self-actualisers*, family is destroyed in the process. Generally, family love is traded-off the more "free" and individualised we become. The system *and* the individual-in-society are to be blamed for social malaise, most evident in recent decades. Agents are *to a degree* free to choose their own lifestyle because they are 'relatively autonomous' (see Davis 2003). In the West, people's views of marriage became more individualistic after the 1960s (Cherlin 2004). Also, the decline in religious influence leading to privatisation of conviction is likely to have undermined people's beliefs about the sacred nature of marriage and its importance as a religious commitment (Zacharias 1997:105). Because of these historical and cultural trends, obtaining a

[32] Sub-hypothesis H1b, is significant in this context in addition to H1 and H1c(ii), since we are also hypothesising that GDP is a good measure of market expansion for capitalism.

divorce is less stigmatising, costly, and time-consuming today than in the recent past.[33] Evidently, the socio-institutional arrangements in America since about the mid-1960s are supporting self-rule of the "Individual", which suits many agents who follow a pragmatic existentialist style of 'living for the moment' (Zacharias 2008). *Economic activity is not being motivated by social obligation nor regulated by the moral and religious context that governs social life in general*.

Economic growth (i.e. the growth of GDP per capita) as a measure of material achievement is, with reference to H1c(ii), a self-defeating measure of real welfare progress. The forces of economic growth—with the abundance of choice and the promotion of the Self that it brings—negate positive social interactions such as mutual trust; in the process, community and family are destroyed (Hamilton 2003, Hirsch 1976, Mishan 1967). Hypothesis one, H1, must therefore be rejected because sociality, good community and a loving family are truer forms of social welfare, not simply economic growth ($GDP_{I,E,O}$). We cannot merely assume that output (GDP), or output per head, is a measure of socioeconomic progress: "[a]n increase in output, statistically measured by a weighted index of physical outputs, may easily be accompanied by a decline in economic welfare" (Mishan 1967:147).

Under the existing institutional arrangement and the rise of individualism, particularly in the West, the evidence above suggests that the durability of social, cultural, familial–community and moral capitals is being destroyed by GDP growth. Hence, the question of durability vis-à-vis GDP becomes important. But what hope is left in 'GDP' as a potentially good measure of welfare and wealth? The supposed strength of 'GDP' is a measure of material (marketed) output; after all, a major component of GDP is "personal *consumption* expenditures". GDP captures at least the well-being that results from the production of goods and services. Indeed, when statisticians quantify the goods and services produced, they *try* to take into account the utility to the consumer (Lequiller 2005). In relation to H1c(iii), a critical question arises, to what extent does GDP measure the durability of 'artefact capital'? The short answer is that GDP excludes the durability of artefact capital (H1c(iii)). The works by Kenneth Boulding (1910–1993) on wealth and welfare reveal a key technical problem of 'consumption' in GDP.

Boulding was animated by Fisher's suggestion that 'wealth' should be

[33] It is suspected that the greater social acceptance of divorce, along with the greater ease of obtaining a divorce, has increased the proportion of divorces that occur among couples with average (rather than low) levels of marital quality (Amato and Hohmann-Marriott 2007). The implication is that the path-dependent effects on children's marital behaviour are magnified, where divorce leads to more divorce. Hence, the global destruction of family may become more permanent over time. However, this is a complex problem: in some contexts, for example, when the separation or divorce brings about an end to prolonged violence, and the wellbeing of children and mothers improves substantially, this outcome is positive.

studied more clearly *and linked* to economic welfare.[34] In "Income or Welfare", Boulding (1949-50:81) saw the 'psychic income' notion as a superior welfare indicator to money or real income (GDP). He argued that we might have, for instance, an increase in national money income (such as GDP_I) that reflects simply a decline in the *durability* of assets, with no subsequent increment of welfare.[35] It is not the durability of "consumption" that matters but the *durability of the wealth itself*:

> [W]ere we possessed of unbreakable china, widow's cruses, waters of life, undying fires, immortal garments and inexhaustible energy we would presumably be better off, economically. ... Any discovery which renders consumption less necessary to the pursuit of living is as much an economic gain as a discovery which improves our skills of production. Production—by which we mean the exact opposite of consumption, namely, the creation of valuable things—is only necessary in order to replace the stock pile into which consumption continually gnaws. [Boulding 1945:2]

That is, Boulding (1945:2) considers 'consumption' as the "destruction of ... valuable things—in the way in which they were intended to be destroyed". With this definition, there is no necessary desirable quality in "consumption".

In *A Reconstruction of Economics*, Boulding (1950:139-41) reaffirmed that real welfare is derived from the increase in services that gives society a capital stock with a *smaller amount of consumption and production*. A house lasting 150 years is much better than one that lasts only 50 years, for example. That is, we need to *concentrate on the growth of real services* rather than to maximise the growth rate of GDP, while reducing consumption as destruction. The smaller the rate of depreciation of artefact capital—that is, the more durable the stock of wealth—the longer the source of the *potential* satisfaction lasts. Thus, "consumption is a nuisance, a real "cost" of maintaining the stock of goods" (Boulding 1949-50:83). People would be better off if they had houses that did not devalue; automobiles and bicycles that would not require repair or updating; floor surfacing that would not get dirty or require replacing; footwear that never needed restoring; clothing that would not wear or plates that would not break. We would be enjoying the services of these things; not consuming or producing them.[36] Therefore, maximising "economic growth" in the consumption (GDP_E) or production (GDP_O)

[34] See Fisher (1937).
[35] Also, he regards "durability" not just of things but of people (e.g. see Boulding 1966c:13).
[36] Thus, he argued that the objective of economic policy should not be to maximise consumption or production, but rather to minimise it (Boulding 1949-50:79). See also Boulding (1957:27-8).

sense provides no indication of the enhancement or deterioration of real wealth and welfare—as H1c(iii) says, GDP excludes the durability of artefact capital.

The operation of GDP concepts in practice thus generates major problems, especially in relation to consumption (H1c). When developing his consumption theory, Boulding made some important points about the dynamics of a mature market system. In "The Consumption Concept in Economic Theory" and "What is Economic Progress?", Boulding (1945, 1961) provides some insights into single composite indices representing economic growth. He argues that growth is a multi-dimensional phenomenon. It involves many dimensions, and cannot be expressed adequately by any one-dimensional index due to its complexity (Boulding 1961:148). He recognised that economic progress in the modern world is actually a transitional process from civilisation to post-civilisation. This process potently affects all features of human life, and is very complex. To limit it within the borders of a single index would be "remarkable" (Boulding 1961:150). The complications of 'consumption' viz. H1c—conspicuous waste, fashion, sociality, community, family durability—illustrate the inadequacy of a single index. Indeed, the heart of the problem is when GDP becomes a *single indicator obsession*.

As a result, the following sub-hypothesis is put forward with specific attention to the three ecological problems associated with GDP (H1d(i,ii,iii)):

H1d: GDP is problematic when it becomes a single indicator fetish:
(i) GDP does not distinguish between growth and sustainable development.
(ii) GDP leaves out ecological capital depletion.
(iii) An adjusted-GDP measure of net welfare is not specified in the green national accounts.

When you measure something it ultimately has an effect on people's behaviour; and as a measure of gross output of the economy, GNP has had an enormous impact on behaviour (see Boulding 1970:159). For instance, the term 'growth potential' is laden with limitations, as failure is inevitable whenever we do not reach a set growth target, however constructed. And since growth can be measured statistically as GDP growth, it follows that more is better. Boulding (1961, 1966b) was well aware of the consequences of the single indicator, namely GNP, and its misuse (H1d):

> [W]e should accept these measures for what they are worth and it is particularly important that we should not take them literally. *A measure is only as good as its use is*

> *sophisticated*. ... [A great] ... danger is that the measure measures something other than what we really want to measure [i.e. net welfare]. ... GNP can rise because of arms races, because of stupid dam-building, or even through the building of presidential palaces. It can be rising because a small proportion of the population is getting better or while the vast majority is remaining in stagnant misery. Valuable as the GNP is, therefore, a rough overall measure of economic success, *it can easily become a fetish and a quite misleading statistic*. Economists certainly should be the first to issue warnings against its misuse. [Boulding 1961:155, 1966b:11, emphases added]

Because of this growth 'fetish', Boulding was increasingly concerned with the technological and extractive processes that have given rise to extreme rates of consumption. He was particularly alarmed that these practices have resulted in a long-run dissimulation and irreplaceability of the geological capital stock, e.g. the falling durability of the soils (Boulding 1949-50:82, 1966a:232). For example, human beings dedicate superfluous effort and resources to cleaning up pollution and mining poorer mineral deposits, yet these extra expenses add to GNP—he frequently referred to GNP as "GNC", the "gross national cost" (e.g. Boulding 1971:159).

Herman E. Daly is another author critical of GNP growth, who gained from the perspectives of Boulding. He scrutinised growth from an ecological perspective and developed the idea of the "steady-state economy" in *Steady-State Economics: The Economics of Biophysical Equilibrium and Moral Growth* (1978) and *Steady-State Economics: Second Edition with New Essays* (1991). A steady-state economy is defined as:

> an economy with constant stocks of people and artifacts, maintained at some desired, sufficient levels by low rates of maintenance "throughput", that is, by the lowest feasible flows of matter and energy from the first stage of production (depletion of low-entropy materials from the environment) to the last stage of consumption (pollution of environment with high-entropy wastes and exotic materials). [Daly 1978:17][37]

Daly's steady-state economy is a material idea, meaning that it is defined in terms of invariable stocks, not flows (quantity measured at a point in time, like an inventory—a stock change). The steady-state economy is not static nor zero growth in GNP. It is in continuous renewal in relation

[37] Entropy is a measure of the quality of energy.

to *qualitative* progression of the stocks of persons and artefacts. The main theme in *Steady-State Economics* is that a steady-state economy is a required future state of affairs and to reach it *there needs to be fundamental changes in principles and values*. We need to replace 'more is better' with 'enough is best'. There is a need to change the GDP growth model and its moral/social values, otherwise no amount of ability will solve our problems but will increase them.

The very notion of a steady-state economy involves a distinction between growth and sustainable development.[38] This is important for H1d(i), since GNP accounting does not differentiate growth from sustainable development. Growth means a *quantitative* increase in the scale of marketed dimensions of the economy. Therefore, GNP is a value-based index of an aggregate of goods and services, which is normally a 'physical' quantity (e.g. the construction of buildings or a lawn mowing service takes up physical space). With GDP growth, there is some confusion about what is supposed to grow. On the other hand, sustainable development means a *qualitative* improvement in the structure, design and composition of the institutions that result from greater knowledge and understanding of social progress (à la reminiscent of Schumpeter). Sustainable development allows more stock maintenance per unit of throughput (matter and energy), and more services per unit of stock. For example, at the microeconomic level the newer generations of computers utilise less energy and mass relative to computers in the past as they can perform more complex processing threads. The non-renewable matter and energy for services decrease, while the value of services increase.[39]

There is much practical relevance in Daly's proposal for addressing a serious global environmental problem. The multifarious array of flora and fauna is at risk with possible onslaught of climate change from too much greenhouse gases (GHGs). The dilemma seems to be in extra contributions of GHGs by human activity, particularly carbon dioxide (CO_2) since industrial times (IPCC 2007).[40] Marland *et al.* (2008) have estimated that since 1751, the consumption of fossil fuels and cement production has released roughly 321 billion tons of carbon into the

[38] See Daly (1996:69) in *Beyond Growth* and Daly (1999:6) in the *Ecological Economics and the Ecology of Economics*.

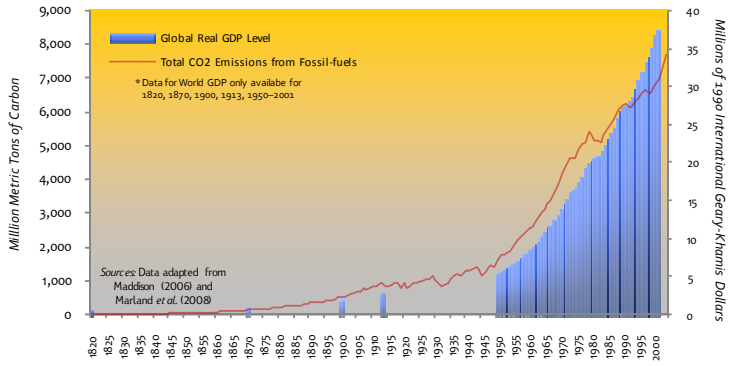
[39] According to Daly, the service (or net psychic income) is the benefit of economic activity while the throughput (entropic physical flow) is 'the final cost'. The throughput flow does not yield services directly; it must be accumulated and fashioned into a stock of useful artefact capital. In one sense, it is true we are "ultimately" constrained by the Second Law of Thermodynamics, especially in a system reliant on *non-renewable* resources.

[40] There is sufficient evidence that building up GHGs is contributing in some way to global warming. Hansen's (2007) *et al.* evidence of the global temperature anomaly shows that temperature deviations during 1890–2006 have been rising on average over time (albeit levelling off in 1950s–1960s). Temperatures rose at a more rapid pace after the major global economic slowdown of 1975, exactly *when GHGs increased to its highest recorded level (from 4615 to about 8000 million metric tons of Carbon in 2006*).

atmosphere. Half of these emissions have transpired since the mid-1970s. Globally, liquids (e.g. natural gas) and solid fuels accounted for 77% of the CO_2 released from fossil-fuel burning in 2005. Emissions from cement production have more than doubled since the mid-1970s. All of these forms of energy are necessary for durable fixed business capital expansion, 'GDP growth' (the foundation of capitalist growth).

There is a major difficulty (but not an impossibility) in achieving a massive cutback in GHGs because GDP (rates or levels) is historically linked to CO_2 emissions under a fossil-fuel based global capitalist system. To illustrate empirically the link between GDP levels and CO_2 emissions from fossil fuels in the global economy, data are adapted from Maddison (2006) (where available) and Marland *et al.* (2008) over 1820–2005.[41] There is a robust relationship throughout the twentieth century between global GDP and CO_2 emissions, as shown in *Figure 2.1* below:

Figure 2.1. GDP and CO_2 Emissions in the Global Economy, 1820–2005*



In the above figure, the simple correlation between the two variables during 1900–2000 is +0.97. The force of inertia entails that current emissions could *potentially* define future stocks. Long time-lags between today's actions of reducing CO_2 and tomorrow's outcomes are thus built into the system because of cumulative (and fairly irreversible) processes of GDP and GHG stocks (UNDP 2007:22,36).[42] A major dilemma of the twenty-first century facing humankind is in restructuring the global capitalist economy on a more "sustainable" basis, viz. the curtailment of excessive fossil fuel use and finding suitable renewable energy sources.

[41] The warming effect is far greater than that simply produced by CO_2. However, longer historical time-series data are more readily available for CO_2 than other types of GHGs.

[42] Atmospheric concentration of CO_2 (*stock* variable) has been constant at around 280 parts per million by volume (ppmv) for many centuries, but since the industrial revolution in the early 1800s they have risen by a third to 380ppmv in 2007. There are no straightforward quick-fix solutions to the 'climate change' problem because of the uncertain nature of the business–environment trade-off. Consider the climate scenario of a pro-environmental model: CO_2 concentration (ppmv) is predicted to increase from 383 in 2005 to 465 in 2030, with a respective mean global temperature change from 0.69°C to 1.34°C. Estimate is based on the assumptions outlined in OECD (2008:494).

Evidently, as a single indicator, GDP does not aid policy prescription for climate change because it does not differentiate between growth (throughput) and sustainable development (service) (H1d(i)).

By itself, GDP provides no indication of *un*sustainable processes (H1d(ii)), i.e. whether we are living off income or capital, and treats the depletion of materials, such as coal, oil, gas, forests, and soils as positive capital consumption.[43] Daly (1996) summarises the broken link between sustainable welfare and GNP in *Beyond Growth*:

> GNP is not only a passive mismeasure but also an actively distorting influence on the very reality that it aims only to reflect. GNP is an index of throughput, not welfare. Throughput is positively correlated with welfare in the world of infinite sources and sinks, but in a finite world with fully employed carrying capacity, throughput is a *cost*. To design national policies to maximise GNP is just not smart. It is practically equivalent to maximising depletion and pollution. [Daly 1996:41]

GDP growth incurs costs such as the disturbance of ecological life-supporting systems, pollution, alienated labour, lost leisure time, loss of restorative and recreative capacity, and the loss of welfare for future generations. The national income statistics series tend to ignore the costs of GNP expansion—this is referred to as 'growthmania' (or growth fetish as in H1d), not counting the costs of growth.[44]

Furthermore, if we *add* to GNP the real costs, as measured by 'defensive expenditures', instead of subtracting them, then the real costs are counted as "benefits" and show up as an increase in GNP. For instance, if pollution occurs in our drinking water, GNP will increase because more purification plants will be required. Other significant defensive costs or expenditures could be categorised in the following groups[45]: *(A)* Induced by the abuse of natural resources in economic growth, such as the costs of all environmental protection activities and compensation expenditures for environmental damages. *(B)* Brought about by production centralisation, spatial concentration and associated urbanisation, such as urban sprawl. *(C)* Caused by the risks generated by the system, such as increased expenditures for protection against crime, accidents, and technical/technological failures. *(D)* Induced by waging

[43] However, this does not mean that GDP ignores nature completely. A *part* of nature's value is already captured in GDP. For example, the value of housing embodies the value of visual amenities enjoyed by residential owners. Likewise, the value of commercial fish, crop, and timber harvests partially "captures" the value of goods and services used to produce the harvests, i.e. *some* of the value of marine fish stocks, irrigation water, and forests is already captured in GDP.

[44] See Daly (1991:99).

[45] The categories are neither exhaustive nor mutually exclusive.

war (foreign policies). *(E)* Encouraged by the negative side effects of car transportation, such as traffic accidents with associated repair and medical expenses. *(F)* Arising from unhealthy consumption patterns (habits), from poor working and living conditions. Costs generated by drug addiction, gambling, smoking (both active and passive), and alcohol. With reference to hypothesis one (H1), real welfare progress is thus distorted in GDP growth due to the prevalence of defensive activities.

Daly (1996:98) argues that any GDP index of welfare is a standing invitation to the *fallacy of misplaced concreteness*—an index which is a "distorted reflection of reality ... instead of directly serving the reality itself":

> Had [the] national accounts developed in accordance with Fisher's concepts, their extension to cover environmental services and ecological and geological capital depletion would have been obvious and easy, except for valuation problems for services without markets. As it is now, incorporation of ecological services and natural capital must be very ad hoc, and in fact it may ultimately be necessary to adopt Fisher's approach. [Daly 1996:109]

In other words, GDP in the national accounts does not distinguish between growth and sustainable development, and on a technical level, it excludes the depletion costs of ecological capital (H1d(i,ii)).

In light of the above discussion, how much has the global system of national accounts changed in the sixty years since their development in 1948? Kapuria-Foreman and Perlman (1995) conclude in their critical assessment of the development of the national accounts that:

> Although the Gilbert version of the accounts has been refined over time, their essential structure has remained unchanged since 1948. While revisions of the national accounting structure to account for new questions and problems have periodically been suggested, such revisions would make consistent comparison difficult. The accounting structure is not fluid or flexible enough to answer questions regarding [net welfare]. [Kapuria-Foreman and Perlman 1995:1532]

For instance, the *United Nations System of National Accounts* 1993 (SNA93), a widely used revision, does not explicitly allow for a calculation of disservices from the economic process due to measurement difficulties. A similar situation exists with ABS Section 7.20 from the

Australian National Accounts: Sources and Methods (ABS 2000):

> Externalities ... or 'disservices'... are not market transactions into which institutional units enter of their own accord, and there is no mechanism to ensure that the positive or negative values attached to them by the various parties involved would be mutually consistent. For this reason, SNA93 recommends against recording the values of externalities in the national accounts. [ABS 2000]

By not revealing many of the environmental costs of the consumption that is measured, the current economic accounts passively encourage over-consumption.

Nonetheless, there have been significant efforts put forward to modify the national accounts by including multiple dimensions of welfare. The ABS as well as other statistical organisations, e.g. Central Statistics Office Ireland (CSO 2004) and Statistics Canada (2005), developed measures of economic, social and environmental progress to supplement GDP. Most statistical agencies provide various headline and supplementary progress indicators. For example, they investigate (a) *health*—life expectancy at birth, incidence of all cancer and heart attacks, and burden of disease; (b) *financial hardship*—average real weekly disposable income of households in the second and third deciles of the income distribution; (c) *the natural landscape*—threatened birds and mammals, annual area of land cleared and the net water use; and (d) the *human environment*—fine particle concentrations, and recycling activities. The function of these supplementary indicators is to provide specificity vis-à-vis the national progress of net welfare. Note that these indicators are yet to be formally integrated within the SNAs.

However, it was clear that a revision of SNA93 (United Nations *et al.* 1993) to include the environment was necessary. The result of a decade of effort is the 2003 edition of the *Handbook of National Accounting*, also referred to as SEEA for the System of Integrated Environmental and Economic Accounting (SEEA-2003) (United Nations *et al.* 2003).[46] The function of SEEA-2003 is to provide a detailed assessment of the stocks of natural resources, plus the flows of expenditures, taxes and subsidies related to environmental protection or management by various sectors. The SEEA-2003 gives a comprehensive image of various accounts, such as the 'energy accounts' that determine energy use by industry, as well as 'water accounts' (see Smith 2007). In relation to sub-hypothesis H1d(iii), we investigate the extent to which an adjusted-GDP measure of net

[46] At the time of writing (April 2009), no country has implemented the complete system, although a few countries (Australia, Canada, Denmark, Germany, Italy, New Zealand and Norway) have implemented accounts that cover many of the system's categories.

welfare is imbedded in the system of green national accounts.

The SEEA framework embraces a parallel system of physical accounts ("natural resource accounts") and monetary accounts ("environmental accounts"). Collectively, these are referred to as the "hybrid flow accounts". The physical accounts are significant, because they were developed to give expression to the objective of a steady-state economy, in which the scale or material throughput of the economy should be held constant. Any raw material (or energy) input or waste material (or energy) output for which physical statistics are available can be evaluated through hybrid flow accounts. The monetary accounts are also significant. Political economists want to articulate trade-offs, measure performance, and enhance social well-being. "The rationale for monetary accounts is that a consistent basis of valuation may be applied precisely so that aggregation across asset classes is possible and comparison can be made with non-environmental assets in terms of their respective contributions to the nation's wealth" (United Nations *et al.* 2003:246). This line of thought reflects the reliance on "asset" (or "capital") rather than "service" (welfare) thinking in SEEA 2003.[47] The hybrid flow accounts in the SEEA-2003 are potentially useful tools for understanding the trade-off between 'economic' assets and 'natural' assets.[48]

However, there are criticisms of the SEEA-2003, several of which are important for H1d(iii). The SEEA-2003 does not explain the need to define ecological sustainability appropriate to specific levels of dematerialization—i.e. How much dematerialization do we need? What is ecological sustainability? Neumayer (2003:7) says that an apparently simple intergenerational rule is that development is sustainable "if it does not decrease the capacity to provide non-declining/per capita utility for infinity". The capacity to provide welfare is conceptually embodied in (at least) four forms of capital: produced, natural, human and social. Hence, there is a need to establish specific rules allowing non-declining welfare over time based on some maintenance of the capital stock, including natural capital.

There are two types of concepts of sustainability, one is weak-form the other is strong-form. The weak sustainability rule requires the rate of change of total net capital not be allowed to be persistently negative. The assumption of weak sustainability entails that natural capital is similar to produced capital and could easily be substituted for it. However, advocates of strong sustainability (SS) argue that natural capital is to a

[47] A subject addressed in their Section 5, "Implications of SEEA 2003" (United Nations *et al.* 2003:257).

[48] There are many cases where the SEEA are important. For example, the results of Langea *et al.* (2007), show that the physical accounts enhance the ability to manage particular natural resources and pollutants. Material flow accounts of material inputs and outputs (of wastes and emissions) can assess the *dematerialization* of the economy [see SEEA-2003 3.197; 11.35,36]. In particular they allow a comparison of trends of indicators such as Total Material Requirement (TMR) with GDP growth.

greater or lesser extent *non-substitutable*. There may be considerable substitution possibilities between the first category of natural capital functions—raw materials for production and direct consumption—and produced capital. However, basic life support systems are almost certainly impossible to substitute. This global ecological system provides us with the basic functions of food, water, breathable air and a stable climate. They should hence be subject to a SS rule. Protecting the physical integrity of *critical natural capital* is a more promising sustainability rule. In this case, it is necessary to define for each capital function what the critical level is to set the SS constraint.

However, Dietz and Neumayer (2007:624) argue that although the SEEA commences with a discussion of sustainability, this discussion is not carried through consistently and no clear guidelines are provided for measuring sustainability in either its weak or strong version, especially with respect to critical natural capital. For example, the potential negative costs of GDP growth on the natural environment are poorly scrutinised. The authors of the SEEA-2003 strike a pessimistic note, suggesting that the challenge to adjust GDP for "depletion", "defensive expenditures" or "degradation" may be too great (see Chapters 9 and 10 of the *Handbook of National Accounting*). In relation to sub-hypothesis, H1d(iii), the major question is, can we calculate a measure of GDP that adequately accounts for demands placed on the environment? The answer is that there is no consensus on how "green GDP" could be calculated and still less agreement on whether it should be attempted at all (United Nations *et al.* 2003:415).[49] The counter-argument is that societies should be able to see how the market system affects the consumption of public goods such as beautiful views, clean air, and unsoiled water (see Boyd 2007:717). Destruction of the environment is, of course, simply one aspect of net welfare.

Bartemulus (2007:616) is critical of SEEA-2003 and argues that the "capital approach" [e.g. SEEA-2003 1.22] seems to focus on the sustainability of economic activity and growth, rather than sustainable development. In accounting terms, economic growth is the rate of increase of a country's final output, usually measured as real (price-deflated) GDP. Sustainable development encompasses social, ecological, cultural and political objectives, besides narrowly economic ones. Other capital categories such as human, social or institutional capitals and their possible deterioration are not accounted for. In other words, the welfare-orientated variables of 'service' and 'disservice' are not explicated in the newer system of green accounts. "Economic growth" in the SEEA-2003 is still narrowly defined as real GDP growth, *not* sustainable development, green GDP or net income (H1d(i,iii)).

[49] Presumably, green GDP captures all final goods and services (the end-products of nature), where "final" refers to the point directly enjoyed, consumed, or used.

Modern systems of national accounts are thus principally a set of interrelated calculations that attempt to cover different aspects of the functionings of market economies. According to Shaikh and Tonak (1994:6-7) in *Measuring the Wealth of Nations: The Political Economy of National Accounts*, the most fundamental of these are the production accounts (national income and product and input-output accounts), which attempt to measure the creation and use of new national wealth. When constructing production accounts, one must distinguish between production *and* nonproduction activities, and hence between their corresponding actual or imputed transaction flows. Many transactions associated with so-called "nonproduction" activities are excluded from the measure of national product (i.e. GDP). "[N]ational-income-and-product accounts ... focus solely on production-related flows. As such, [it] leave[s] out two important aspects of the overall economic picture: transactions that are not directly related to production; and stocks of real and financial wealth" (Shaikh and Tonak 1994:7). As such, narrowly defined "production" (GDPo) activities inhibit a holistic understanding of sustainable economic welfare.

Ultimately, GDP may need to be modified as it provides an inadequate measure of social and environmental waste in the economic system. We reject the conscious pursuit of economic growth as a prime goal of economic policy, especially when GDP growth becomes a fetish (see also Hamilton 2003:220, Mishan 1967:219). In addition, GDP provides little indication of any ecological barriers or limitations under capitalism. GDP growth, thus, does not provide a very good *direct* measure of additions to welfare (H1). Better indicators, which take into account the benefits and costs of economic growth, are probably needed. The next section looks at some of the alternatives to GDP that attempt to measure net income, which is scrutinised in more detail in a few chapters that follow.

2.4 Attempting to Improve on GDP: Net Income Indices

An indicator that looks at the trend in the original sense of "economic growth" (net income) over time is the Index of Sustainable Economic Welfare (ISEW). Herman Daly and John Cobb (1989) in their groundbreaking book, *For the Common Good*, pioneered early work into developing a more appropriate measure of welfare. They devised the very first ISEW; for the US over the 1950–1986 period (see Cobb 1989). Daly and Cobb (1994) revised their book for a *Second Edition* in which they modified the United States ISEW somewhat after accounting for various criticisms raised by scholars (Cobb 1994, Cobb and Cobb 1994). Their work was significant because it was the first indicator assessing economic welfare with attention to income distribution, household production *and* environmental destruction. An adjustment for income

inequality in the ISEW was based on the premise that the benefits of economic growth may disproportionately advantage the rich. The authors argue that by disregarding transfers of production between market and household sectors, the comparability of national income estimates for an economy over time is diminished. It also gave attention to environmental sustainability, such as the costs of long-term environmental damage, including climate change, air, water and noise pollution. They argue that accounting for sustainability is needed in a measure of welfare, especially when it affects future generations.

A succinct and workable identity of a real ISEW per capita is summarised in Eq. (2.3) below:

$$\text{ISEW} = \hat{s}[C_K/D + F_K + L_t] - d\check{s}[C_K + F_K + L_t] - \delta E_K \quad (2.3)$$

Where:

$\hat{s}$	=	service derived from…
$d\check{s}$	=	disservices flowing from…
C_K	=	final consumer goods/services capital
D	=	income distribution
F_K	=	durable fixed capital
L_t	=	non-market labour or socio-environmental activities
δE_K	=	depreciation of ecological capital

Eq. (2.3) reads as follows: the ISEW (per capita) at constant prices is equal to the services ($\hat{s}$) derived from the final consumer capital (adjusted via an index of income distribution, C_K/D), durable fixed capital (F_K) and from non-market labour activities (L_t); subtracting the disservices ($d\check{s}$) generated from economic activity in order to receive the services; and minus the depreciation of ecological capital (δE_K). This basic equation can be expanded to include the relevant variables. For example, the services flowing from final consumer capital, durable fixed capital, and non-market activities encompass, respectively, 'personal consumption expenditures' (including consumer durables), government roads and highways, and household labour. Economic activity also generates negative activities, e.g. crime, lost leisure time, pollution. These types of disservices (or costs) of the economic process are thus deducted. Finally, the net positive services of the current generation and the well-being of future generations depend on the condition of ecological assets. Hence, Eq. (2.3) says that the ISEW is equal to the services generated in an economy after subtracting the disservices endured, including a deduction for the lost services of ecological capital.

The ISEW in Eq. (2.3) appears to overcome many of the problems of GNP, since it accounts for the benefits of non-market production and consumer goods while adjusting for income inequality, but also the environmental and health costs related to consumption activities. Briefly, we consider the historical context and conflict of interest between the ISEW and GNP/GDP. 'GDP' was brought to the fore when the status quo

developed it primarily as a planning tool to guide the massive production effort after World War II (see *Section 2.3*). The ISEW was developed because of the growing opposition to natural environmental degradation and negative health effects from pollution in the 1970s and 1980s. Each indicator was created in different social contexts: 'GDP' became established after the Second World War where increased 'production' was seen as vital to well-being because of so much death and destruction during war times. The 'ISEW' developed in relatively more peaceful circumstances, but in the midst of an apparent environmental crisis in the 1970s/1980s. Also, a growing ecological consciousness, largely attributable to the environmental movement, spurred opposition to the GDP indicator, the primary indicator of economic growth.

These incidences made way for better indicator alternatives that accounted for the environment and the economy. In terms of measurement advancement from a historical perspective, the objective of Daly and Cobb (1989) was to build on two previous studies, Nordhaus and Tobin's (1972) Measure of Economic Welfare (MEW) and Zolotas' (1981) Economics Aspects of Welfare (EAW), which attempted to measure the trend in economic welfare for the United States compared to the trend in GDP. The ISEW is, on the surface, a redevelopment from the original MEW and EAW frameworks, but there are some noteworthy differences,—albeit somewhat elusively discussed—namely, the inclusion of 'sustainability' and the recognition of the 'service' notion to the community. However in this study, we primarily delimit the scope of the analysis to ISEW and related measures developed thereafter.

There are several other indicators of net income similar to the ISEW that need to be scrutinised. A number of alternatives to GDP that encompass environmental and social factors include the Genuine Progress Indicator (GPI), Sustainable Net Benefits Index (SNBI), and Fisherian Income (YF). Collectively, these composite measures may be referred to as 'Net Income Indices' or Sustainable Economic Welfare Indicators (SEWIs) since they are designed for assessing aspects of *sustainability* and *welfare*.[50] 'Consumption' is the welfare base of the indicators and is taken directly from the SNA. But the authors utilise a variety of statistical sources and government reports to include other variables. Generally, the authors of SEWIs add the monetary service benefits yielded by *both* the stock of consumer and public durable expenditures (while adjusting personal consumption for income inequality) *and* household/unpaid production, minus the environmental and social costs associated with production, distribution and exchange.

This leads to the introduction of sub-hypothesis, H1e,—viz.:

[50] *N.B.* GDP uses proxies for value (prices) to create an index of the market economy's 'value'. This means that GDP cannot be said to equal 'the social benefit of the market economy', which cannot be practically calculated (Boyd 2007:717). In the same way, these adjusted-GDP net income indices *should* never be equated with the 'net social and environmental benefits of society'.

H1e: Alternatives to GDP are possibly needed, such as Net Income Indices.

The crux of Cobb and Cobb's (1994) main argument in *The Green National Product* is that there would be no tendency to use GNP as a surrogate measure of economic welfare if an alternative were developed that performed that function more adequately than GNP. The alternative indicator of welfare they are referring to is ISEW:

> As long as GNP continues to be misused by politicians and newspapers as a comprehensive measure of well-being, there will be reason to broaden the definition of economic health to include categories that have been left out of the national accounts. ... Policies are [usually] debated in terms of what is "good for the economy", where "the economy" means GNP. ... When GNP is used, explicitly or implicitly, for purposes of measuring well-being or national prestige, it is just as value laden as any other index. [Cobb and Cobb 1994:23,251]

Thus, Cobb and Cobb (1994) deem it vital to develop an indicator that measures the genuine net positive contribution of economic activity (broadly defined) to well-being (H1e). The alternative they wish to enhance and modify is the ISEW.

On the other hand, these authors (specially) note that the ISEW is *not* a comprehensive indicator because it is only a one-dimensional summary measure. Indeed, they argue that no single measure can grasp the full complexity of the benefits and costs of life in a modern society:

> A measure of social welfare, as opposed to economic welfare, would necessarily have to include factors that cannot be valued in monetary terms. Even an economic welfare measure must account for features of life that are difficult to quantify. *But that should not deny the value of formulating alternative measures of economic welfare that go beyond GNP and include estimates of nonmarket activities*. [Cobb and Cobb 1994:23, emphasis added]

However, they conclude that it is important to combine the benefits and costs of production in a single account, so that the net effects can be discerned (see Cobb and Cobb 1994:250). The authors also hold that there are advantages of counting all activities in the same unit of value, money, since "[t]his allows the valuations by millions of individuals to be

combined into a single number without having to survey them or assign arbitrary weights to their choices" (Cobb and Cobb 1994:10). Therefore, composite monetary indicators, i.e. Net Income Indices or SEWIs, as alternatives to GDP are possibly needed (H1e).

What could be at stake is the choice between an ethics based on unlimited wants (indicative of GDP) in which "more" is the objective and an ethics of "enough" which is based on needs, as in the ISEW. One, implicitly assuming the 'maximisation principle', sees no limits to individual acquisition; the other, recognising *some* social and ecological aspects, counsels' responsibility, sharing and moralistic restraint by accounting for costs. Thus, each indicator is value-laden. But the ISEW seems far more interesting than GDP, as it specifically attempts to recapture the original and the most significant meaning of "economic growth", *net welfare*.

2.5 Conclusion

In conclusion, economic growth is *not* a very good measure of true welfare progress. Historically, the national income was understood as a sustained increase in its magnitude of *services* over a long-term trend. We argue that "economic growth" was historically understood as 'net income' (genuine welfare of society) and, therefore, only in this context hypothesis one (H1) is acceptable. But, with the formal institutionalisation of the US system of accounts in 1948, 'economic growth' signifies market-based production activities and *not* 'net income'. In other words, post-1948, economic growth is synonymous with the growth rate in Gross Domestic Product (GDP). GDP growth relates to the rate at which the *marketed* value of goods and services is expanding in a specific region (e.g. the world or a continent).

The usefulness of the economic growth indicator is in its efficacy of understanding the dynamics of the economic system, especially the effective demand function in the business cycle. Nonetheless, utilising GDP growth per capita as *the* single indicator of growth, economic performance or welfare may be problematic. GDP growth incurs costs such as the disturbance of ecological life-supporting systems, pollution, alienated labour, lost leisure time, and the loss of welfare for future generations. If a high level of GDP is the ultimate policy goal, then clearly it is a misused index to represent a high level of social welfare. On this basis, hypothesis one (H1)—that economic growth is a good measure of welfare progress—is rejected.

There are several primary reasons why H1 is rejected. Firstly, the complications of 'consumption' in relation to conspicuous waste, fashion, the destruction of community, sociality, family and the rise of individualism illustrate the inadequacy of GDP. Maximising "economic growth" in the consumption or production sense provides no indication

of the enhancement or deterioration of real wealth and welfare. This is because the objective of economic policy should be that of expanding a *durable* range of net positive *services*.

Secondly, GDP may be a good proxy measure of economic *growth* but not when 'net contributions to welfare' are at the heart of the inquiry. The reason for this is that the 'eco-development' notion of progress in 'economic growth' has been misplaced concretely; that is, GDP accounting does not differentiate growth from sustainable development. There is a major limitation to the green national accounts (SEEA-2003) in measuring net welfare. "Economic growth" in the SEEA-2003 is still narrowly defined as real GDP—not 'sustainable development' or "green GDP". H1 is rejected because it is difficult to ascribe a level of 'sustainable development' in the green national accounts.

As a single indicator, GDP does not portray how much is invested in expanding net positive service; how much is consumed (destroyed) in various forms; and how much is wasted and in what ways (sustainably or unsustainably). Hence, GDP—purely as a measure of output, income or expenditure—is a problematic indicator of social and environmental problems. There is no specification of how the productive capacity is utilised, e.g. waste versus investment. Also, GDP leaves out ecological capital depletion. The heart of the problem is when GDP becomes a *single indicator fetish*, as there are too many unresolved socio-ecological problems of GDP.

However, adjusting or modifying GDP to construct some sort of 'net value' of environmental and socioeconomic welfare is *potentially* important. Therefore, effective measures of net welfare (or net income) may be required. A well-devised indicator that measures the costs and benefits of economic growth over time may help. An interesting indicator, which attempts to measure net income, is the Index of Sustainable Economic Welfare (ISEW). The purpose of the next chapter is to see how closely the ISEW encapsulates the original meaning of "economic growth" (the net of services and disservices). But, more importantly, we critically evaluate the theoretical framework of the ISEW. Chapter three will detail the conceptual foundations of the ISEW, where the purpose is to interpret the ISEW and apply theory. This is needed to establish a level playing field—to understand the evolution of similar indicators to the ISEW.

Chapter 3.
Theoretical Foundations of Sustainable Economic Welfare Indicators—ISEW and Political Economy of the Disembedded System

3.1 Introduction

In the previous chapter, we gave a historical overview of accounting for income and welfare. It is widely recognised by political economists that the growth rate of GDP (gross domestic product) per capita is not a very good measure of welfare. GDP may need to be modified as it provides an inadequate measure of social and environmental waste in the economic system. Hence, adjusting or modifying GDP to construct some sort of 'net value' of environmental and socioeconomic welfare is *potentially* important. Good measures can offer critical insights where there may be conflict between the various spheres of economy, society and ecology. A well-devised indicator that measures the costs and benefits of economic growth over time may help. We introduced an indicator that attempts to measure "net income", the Index of Sustainable Economic Welfare (ISEW) by Daly and Cobb (1989). We now want to investigate the ISEW in more detail.

An imperative question arises: are there any good theoretical foundations for the ISEW? Guenno and Tiezzi (1998:11), authors of the Italian ISEW, stated that the "main limitation of indices such as the ISEW is ... their lack of theoretical foundation". Eric Neumayer (1999) also argues that the ISEW is not a theoretically sound indicator. For instance, he says that the corrections in ISEW are simply undertaken without giving any theoretically sound justification for doing so (Neumayer 1999:82). Hitherto, there have been several efforts to provide such a foundation, particularly, by Philip Lawn (2003, 2006a) as a response to Neumayer's (and others') critique. Amongst the ISEW advocates, the emerging debate surrounding the 'net income' indices appears saturated in methodological (i.e. measurement) limitations, not in the theoretical underpinning. For instance, in response to recent criticisms, Lawn and Clarke (2006:300, emphasis added) argue that "its apparent shortcomings ... are methodological and *not theoretical in nature*". Nevertheless, Neumayer (2004, 2007) argues that there are conceptual problems for an all-in-one indicator that accounts for present well-being *and* future well-being (sustainability). In other words, the conceptual foundation of ISEW and related indicators is chiefly unresolved in the literature.[51] Also, the tacit knowledge amongst critics and advocates alike

[51] A shorter version of this chapter is published in the journal of *Ecological Economics* (Brennan 2008). Most of the content republished here is in accordance with the Elsevier end-user licence

is that there has been *no* adequate theoretical foundation in the ISEW since its humble beginnings.

However, these conclusions may be premature because careful inspection of several key works reveals certain theoretical frameworks for ISEW. This leads to the introduction of hypothesis two (H2) – viz.:

> H2: The ISEW has strong theoretical foundations.

Chapter 3 will detail the conceptual foundations of ISEW by attempting to expand on the critical themes and fill any thematic gaps. A primary function of the chapter is to interpret and apply theory. This is needed to establish a level playing field—to understand the evolution of similar *sustainable economic welfare* indicators and to present them in their best light. It is not only the purpose of this chapter to provide insight into the theoretical foundations of ISEW, but also to offer a critique, if reasonable. But even if it is not possible to fill the gaps completely, it is argued that there are *three* underlying and qualitatively different theories of the ISEW (H2).

The three ISEW theories will be made cogent in *Sections 3.2, 3.3 and 3.4*. In *Section 3.2* a scrutiny of Daly and Cobb's (1989) work reveals a theoretical framework—albeit somewhat concealed and fragmented—for ISEW. Thus, the first theory explores Daly and Cobb's conceptual "*economics for community*" model for ISEW, which considers the costs and benefits to the whole community, not merely individual agents involved in a transaction. The second theory links Fisher's concept of income to entropy: *entropic net psychic income*. This theory, discussed in *Section 3.3*, specifies that it is a cost to replacing worn out producer goods such as plant, machinery, and equipment. The third theory, examined in *Section 3.4*, suggests that ISEW is theoretically based on a *social welfare function*. Utilising some principles of welfare economics, the ISEW integrates cost-benefit analysis with social choice theory, which incorporates various social concerns about welfare that are not adequately captured by individuals within the market place.

In order to promote specificity vis-à-vis the theoretical foundations of ISEW, Venn diagrams and set theory notation are utilised. The purpose of the Venn diagrams is to illustrate the similarities and differences between the theories. The usefulness lies in the visual comparative analysis, specifically: How well does each theory link the spheres of economy, ecology and society? Indeed, the conceptual foundation of ISEW depends on the answer to this question. If ISEW is to be a meaningful indicator, a solid conceptual foundation that describes the prevailing socioeconomic system is essential.

---

agreement.

However, we are going to show that the three theories are not as well developed as they should be. The heart of the inquiry rests in *Section 3.5*—where we critically evaluate the theoretical frameworks of ISEW. It is argued that without a *systematic understanding of the political economy of capitalism*, ISEW is potentially flawed in design. At the very least, "society" must be historically placed vis-à-vis a specific socioeconomic system. Under a self-regulating market organisation, the exchange economy tends to dominate other aspects of culture—opportunities for individual development are obtained mainly at the expense of others. This is known as the 'disembedded economy'. It is argued that the conceptual foundations of Daly and Cobb's vision of community, entropic net psychic income, and the social welfare function are problematic, because there is no underlying linked systems view of the disembedded economy.

Thus, the chapter is structured into two major segments. The first part will supply the three theoretical foundations of ISEW. The second part furnishes a political economy critique of the theories. In both segments, we will use table headings to guide the analysis. This makes it easier for the reader, as each major heading (sub-hypothesis) summarises the essential points at the beginning of each section. In *Section 3.6*, we conclude with reference to the main hypothesis, H2, and comment on the findings. Here are the three theories, introducing the "economics for community – oikonomia" in *Section 3.2* below:

3.2 Economics for Community – Oikonomia

H2a: The ISEW is conceptually rooted in "Economics for Community":
(i) A realistic paradigm based on the *principle of internalization*.
(ii) In principle, income is based on *strong sustainability*.
(iii) *Service* to the community is founded on the *oikonomia model*.

According to Herman E. Daly and John B. Cobb (1989:6,8), ISEW plays a small part in a necessary process that leads to a *paradigm shift in Economics*. Orthodox Economics has a tendency to treat the negative effects from the production and consumption of copious goods and services as secondary (Daly and Cobb 1989:6), and subscribes to vast abstractions that relate little to reality itself (e.g. 'Homo Economicus', a requirement to find models and laws applicable to all human beings). The authors argue that the paradigm shift entails describing how the world *is*. "The [paradigm] change will involve correction and expansion, a more empirical and historical attitude, less pretense to be a "science", and the willingness to subordinate the market to purposes that it is not geared to determine" (Daly and Cobb 1989:8). Economics must be ordered to the needs of the real world (Daly and Cobb 1989:7,20), and

ISEW is set out to measure, albeit limitedly, how well the needs of the world are met.[52] ISEW is a necessary progression for the paradigm shift because of perceived ecological limits of economic expansion; the latter is commonly signified by the annual growth rate of gross domestic (or national) product (GDP/GNP).

The current paradigm of Orthodox Economics seeks to find out what makes the market function well. GDP is frequently utilised as a sign of a healthy market:

> But it is rightly held that the economic element in welfare is *very* important, and that the stronger the economy the greater the contribution to human welfare. ... [T]here is little consensus on any other measurement, so that none of the others that have been proposed exert a remotely comparable influence on public policy. [Daly and Cobb 1989:63]

The tendency to overlook the fact that GDP measures only *some* aspects of welfare and to treat it as a general index of national well-being is an archetypal instance of the *fallacy of misplaced concreteness*—"whenever thinkers forget the degree of abstraction involved in thought and draw unwarranted conclusions about concrete actuality" (Daly and Cobb 1989:36).

Hence, ISEW is essentially a fundamental critique of orthodoxy's strange abstractions from reality, a shift from the deductive to the historical model (Daly and Cobb 1989:93,141). Trying to circumvent the fallacy of misplaced concreteness means strongly adhering to the *principle of internalization*:

> [t]he principle of internalization is not only equitable (whoever causes the cost should pay for it) but also socially efficient (the one who pays the cost is also the one who is in a position to reduce the activity that causes the costs and will benefit from doing so). ... It is not a question of choosing whether to pay or not pay external costs. *The costs are there and will be paid by someone*. [Daly and Cobb 1989:56, emphasis added]

There is need for "*collectivism of totally socializing the costs*", such as the social costs of pollution, inequality, commuting, automobile accidents, regrettable health and education expenditures, and long-term environmental damage for future generations. In relation to hypothesis H2a(i), the 'theoretical' foundation of ISEW is to describe reality by

[52] The compilation of ISEW was actually done by John Cobb's son, Clifford W. Cobb.

agreeing with the principle of internalization: internalising localised 'spillover effects' and "pervasive externalities" that negatively affect social welfare.

With this underlying principle available, one can derive a better indicator of welfare from a conceptual foundation of income. Operationally, however, this is fraught with difficulties. Firstly, "in measuring welfare one cannot avoid to a large extent implicitly defining the concept by one's very measure of it" (Daly and Cobb 1989:69). Secondly, "any measure of welfare abstracts from many features of actual economic welfare and its use would lead to ignoring the degree of abstraction involved. The very existence of a measure *invites* the fallacy of misplaced concreteness" (Daly and Cobb 1989:84). In practice, the welfare concept is incomparable with the income notion (i.e. income does not directly measure welfare).

Nevertheless, the authors utilise Hicks' (1948:172) definition of income in *Value and Capital* as an opening point for the indicator of welfare: "the practical purpose of income is to serve as a guide for prudent conduct".[53]

> A person's or a nation's income is defined as the maximum value that can be consumed during some time period, with the expectation of still being as well-off at the end of the period as at the beginning. [Hicks 1948:172]

While Hicks was thinking at the individual level, income can be conceived at the national level and for annual periods. The authors of ISEW state,

> [i]ncome is not a precise theoretical concept but rather a practical rule-of-thumb guide to the maximum amount that can be consumed by a nation without eventual impoverishment. ... Note that the central defining characteristic of income is *sustainability*. The term "sustainable income" ought therefore to be considered a redundancy. [Daly and Cobb 1989:70]

However, because of the self-fulfilling need to "identify and understand the contingent features of reality" (H2a(i)), they want to connect the growth of the economy and the physical limits of the biosphere in a

[53] Hicksian income may be defined as the maximum monetary value of final goods and services that can be consumed over a given period without reducing the capacity to sustain the same consumption stream over time. It is a significant measure of income because, as Hicks emphasised, the central criterion for defining the concept of income is "to give people an indication of the amount which they can consume without impoverishing themselves" (Hicks 1948:172).

welfare indicator (Daly and Cobb 1989:28).[54] This is because the economy is coextensive with the total system whilst the economic subsystem is infinitesimally small relative to the total system (Daly and Cobb 1989:59).

In relation to hypothesis H2a(ii), they undertake two adjustments to arrive at a good approximation of Hicksian income to be a better guide to prudent behaviour. One important adjustment is an extension of the principle of depreciation to cover consumption of natural or ecological capital stocks. The other is to subtract "defensive expenditures", which are regrettably necessary expenditures made to defend ourselves from the unwanted side effects of economic growth.[55] They subtract defensive expenditures because these, as a proxy, represent the principle of internalization. Defensive expenditures are 'intermediate goods' which are the costs of production, in contrast with the *final products* available for purchase that enhance welfare. The conjectural focus on this ISEW is thus the distinction between final and intermediate causes. Therefore, to gain a better approximation to the central and well-established meaning of income (Daly and Cobb 1989:71), they summarise the extended version of Hicksian income (YH) as the net national product (NNP) minus both defensive expenditures (D) and the depreciation of ecological capital (δE_K), in Eq. (3.1) below:

$$YH = NNP - D - \delta E_K \tag{3.1}$$

These two adjustments for including defensive expenditures and the depreciation of ecological capital in Eq. (3.1) are relevant for ISEW. This ISEW embodies the idea that "[w]e should never sacrifice more value to produce an extra amount of product that is of less value than what was sacrificed" (Daly and Cobb 1989:58).

In addition, they argue that it is necessary to consider welfare and income within the context of 'sustainable development'. Daly and Cobb (1989:71) distinguish between growth and development. 'Growth' refers to the quantitative expansion in the scale of the physical dimensions of the economic system, while 'development' refers to the qualitative change of a physically non-growing economic system with the environment. They note that the key operational implication of Hicksian income is to keep *capital intact*.[56] They define capital functionally, "as a stock that yields a flow of goods or services" (Daly and Cobb 1989:72). However, the two forms of capital they explicitly embrace are natural and

[54] The biosphere is where living organisms occupy the regions of the surface and atmosphere (ionosphere, stratosphere, and troposphere) of Earth.

[55] "Defensive expenditures" are examined in *Section 3.4* below.

[56] Nordhaus (1998:315) notes that the underlying definition in Hicks is different from that cited by Daly and Cobb above. Nonetheless, the "capital intact" definition of income presented by Daly and Cobb improves the measure of social income based on the notion of sustainability (Nordhaus 1998:321).

humanly created capital. They advocate the *strong sustainability* approach to operationalising sustainable development, which means maintaining different types of capital stocks intact (i.e. that there are no substitution possibilities between a degraded stock of ecological capital and produced capital). For example, farming capital equipment cannot replace (substitute) the fertile soils lost from intensive cultivation. In other words, the authors utilise the extended notion of Hicksian income to act as a pragmatic guide to avoid impoverishment by overconsumption, and thus attempt to measure maximum sustainable consumption in ISEW from a strong sustainability perspective (H2a(ii)).

But for hypothesis H2a(iii), the *sine qua non* is that a core theory guides the measure of sustainable consumption. That is, ISEW is embedded in *oikonomia*, the management of the household to *increase its use value* to all members over the *long run*. In essence, oikonomia is stewardship. "If we expand the scope of household to include the larger community of the land, of shared values, resources, biomes, institutions, language, and history, then we have a good definition of "*economics for community*"" (Daly and Cobb 1989:139, emphasis added). 'Oikonomia' contrasts to 'chrematistics', which is the branch of economics relating to the manipulation of property and wealth in order to maximise short-term monetary exchange value to the owner (e.g. see Stahel 2006:371). Oikonomia differs from chrematistics in three ways. Firstly, it takes the *long-run* rather than the short-run view. Secondly, oikonomia considers *costs and benefits* to the *whole community*, not merely the costs/benefits limited to agents involved in a transaction. That is, beneficial or costly transactions between persons do not simply pertain to the parties directly involved, but rather, affect the total social matrix. Thirdly, it focuses on *concrete use value* and the *limited accumulation* thereof, which contrasts with the notion of abstract exchange value and the impulsion toward unlimited accumulation. 'Use value' is concrete: it has a physical dimension and a need that can be "objectively satisfied". "True wealth is limited by the satisfaction of the concrete need for which it was designed [e.g. a gift intended for love rather than envy]. For oikonomia, there is such a thing as enough. For chrematistics, more is always better" (Daly and Cobb 1989:139).

Therefore, "oikonomia" views the market from the perspective of the *total needs of the community*:

> The *management of the community* so as to *increase use value to all members over the long run* requires that the market be of the right size to make its positive contributions while *minimizing its harmful effects*. For economics for community, the question of *optimal scale* is central. [Daly and Cobb 1989:158, emphases added]

To deal with pervasive externalities or 'disservices', such as global warming and ozone depletion problems, they argue that the economy must have a proper scale relative to the ecosystem (Daly and Cobb 1989:144-5).[57]

The "optimal scale" is linked to the notion of *service* (H2a(iii)). Interpreting Daly and Cobb's theory, ISEW *loosely* follows Irving Fisher's (1906) notion of service, i.e. "psychic income". In Fisher's view, nearly all consumer goods are classed as capital or as wealth, and their consumption represents depreciation. "For Fisher, welfare is the service (the psychic sense of want satisfaction) rendered by this wealth, and for the most part would have to be imputed" (Daly and Cobb 1989:67). However, the authors give no theoretical 'psychic income' framework for the indicator. For instance, after the inclusion of personal consumption expenditures adjusted for income distribution, they

> add ... [the] streams of services that are not counted as part of personal consumption in the national income accounts. Next, [the authors] subtract ... items intended to compensate for implicit overestimates of welfare in the measure of personal consumption [i.e. types of "disservices"]. [Daly and Cobb 1994:465-6]

Thus, only the "flow of services" is recognised, but no formal conceptual framework is devised, and there are no formal 'service' and 'disservice' accounts. Nonetheless, 'disservice' is not mentioned either, but it is obviously implied under the "cost columns".

In summary, with respect to sub-hypothesis H2a, the conceptual model of ISEW centres on a historical increase of use values over time, i.e. *services to the community over the long-run* (H2a(iii)). This requires that the market be of the right size—via an optimal scale—to make its positive contributions while minimising its harmful effects (H2a(i)). ISEW describes the relationship between the services and disservices over time, as well as the path taken to arrive at a particular point. The ISEW follows the non-substitutability paradigm, i.e. 'strong sustainability', maintaining the different types of capital stocks intact (H2a(ii)). In other words, 'for the common good' entails redirecting the economy toward community, the environment, and a sustainable future, where, over time, the services are predominantly increasing and the disservices are diminishing. With these qualities, we are ideally achieving *sustainable economic welfare*.

Sustainable economic welfare (SEW) can be represented in simple

[57] It is important to position the 'optimal scale' in terms of the *steady-state economy*, an important idea developed by Daly (1991:99).

algebraic terms. Eq. (3.2) below portrays SEW equal to the net sum of services (ŝ) over the current period (t) which is greater than the net sum of disservices (dš) compared to the past ($t\text{-}n$):

$$SEW = \sum(\hat{s} - d\check{s})_t > \sum(\hat{s} - d\check{s})_{t\text{-}n} \quad (3.2)$$

In Eq. (3.2), SEW is enhanced in the *long run* when services-to-the-community are equitable and sustainable; whilst waste (i.e. disservices) is minimised from harmful activities. The trend of ISEW would increase over time. However, when the net of services over the current period is less than the net of disservices in the past period(s), unsustainable economic welfare transpires. It is unsustainable for future generations as the community is being destroyed; there are too many disservices generated over the long run. The trend of ISEW would decrease over time. But, achieving 'SEW' is the heart of Daly and Cobb's theoretical oikonomia model, *economics for community* (H2a). That is, the services and disservices are anchored in value judgements that society should encourage the higher values (service) and purposefully discourage the lower (disservice).

Finally, Daly and Cobb call for the oikonomia model (H2a(iii)), as part of the 'new paradigm', which recognises that the well-being of a *community* as a whole is constitutive of each person's welfare. "[T]his model of person-in-community calls not only for provision of goods and services to persons, but also for an *economic order* that supports the pattern of personal relationships that make up the *community*" (Daly and Cobb 1989:165, emphases added). The person-in-community notion is critical because each human being is constituted by relationships to others, and this pattern of relationships is at least as important as the possession of commodities.[58] "The goal of an economics for community is as much to provide meaningful and personally satisfying work as to provide *adequate* goods and services" (Daly and Cobb 1989:165, emphasis added). These relationships cannot be exchanged in the market. Therefore, rather than giving pre-eminence to the market economy, the *community* takes the centre stage in the oikonomia model (see Daly and Cobb 1989:165).

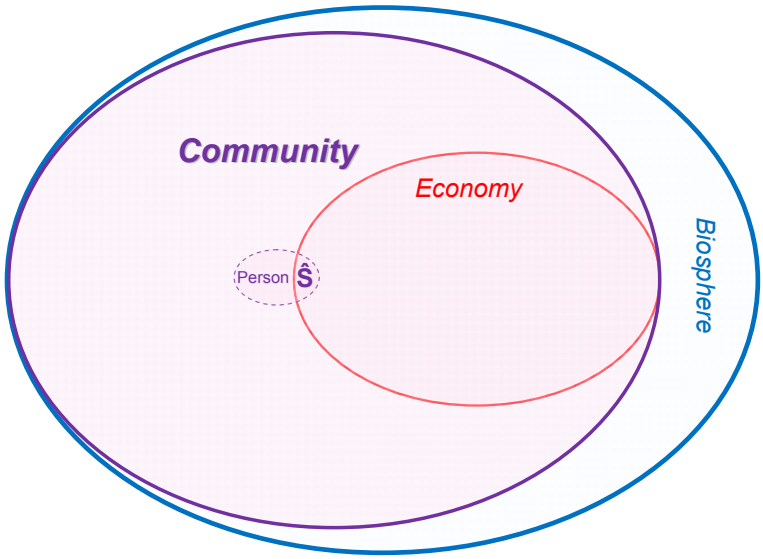
By the term "community", the authors suggest that people are bound up with one another, sharing, despite differences, a common identity. 'Community' necessitates that people participate together in shaping the larger grouping of which all are members (Daly and Cobb 1989:170,172). Daly and Cobb reason that the degree of community depends on the following attributes concurring: (a) there is extensive participation by its members in the decisions by which its life is governed; (b) the society as

[58] Ziegler (2007) is the only other author who notes that Daly and Cobb (1989) had the persons-in-community notion set in their hearts for the ISEW.

a whole takes responsibility for the members; and (c) this responsibility includes respect for the diverse personality of these members. Specifically, the *economics for community* depends on the extent to which the following conditions are democratically defined: decentralisation of political and economic power; worker ownership and participation of management decisions; and the subordination of the economy to social goals. That is, implied in the oikonomia model is participatory democracy in the economy; and hence the significance of person-*in*-community.

Figure 3.1 below portrays the oikonomia model, where the *community* is primary and the economy is secondary, and the services flow to the person-in-community:[59]

Figure 3.1. The Oikonomia Model for Sustainable Economic Welfare: *Service to the Community*



There are dynamic processes in *Figure 3.1* above, albeit portrayed statically.[60] The economy reproduces both service (Ŝ) and disservice (dš). But, when there is *economics for community*, the disservices generated are minimal and, therefore, depletion of the biosphere is not a significant problem. When the community grows and develops,

[59] *N.B.* In set theory, the '*set*' (or the '*system*') is italicised, and the elements (or members) in the universal set are non-italicised, where:
Ụ = the universal set, containing everything within the outer boundary area.
∪ = the union of sets, including everything within the boundary area of the combined sets.
∩ = the intersection of sets, including everything within the area of overlap between the sets.
⊂ = a subset (or subsystem) of another set (or system). This type includes the members of the other subset(s), but the subsets are mutually exclusive (i.e. not equal to).
∈ = member(s) (or element(s)) of the set and any of the subset(s).

[60] In *Figure 3.1*, Ụ = *Biosphere*. *Economy* ⊂ *Community* ⊂ *Biosphere*. In other words, '*Community*' and '*Economy*' are subsets of the '*Biosphere*'. The '*Community*' comprises the number of people living in an area (e.g. nation or region) receiving the services. *Community* = {Person, Service}. The dashed circle delineating the elements in the '*Community*' (i.e. 'Person' and 'Ŝ') illustrates a representative and unique member of many members in the three sets. The 'Person' resides in all three systems. 'Ŝ' is a representative service to the person-in-community.

sustainable economic welfare is attained. That is, implied in *Figure 3.1* are the conditions set in Eq. (3.2) for ISEW: an economic order based on services to the person-in-community, which is equitable and sustainable; whilst waste is minimised from harmful disservice activities. Thus, the oikonomia model expresses *harmonious social community and biophysical interdependence*.

However, the ISEW falls short in capturing the essence of the authors' hearts, an appropriate measure of the community expression of love. That is, the amount, quality, and character of that love, and all that go with it, which affect the entire person. Chapter 8 in *For the Common Good* contrasts much of what should be measured to how much one can measure. Apparently, the missing element within ISEW is accounting for social capital. The authors note that 'oikonomia' suggests that no quantifiable features of the community can measure its actual health (Daly and Cobb 1989:141), and thus they would probably agree that it would not be practicable to include a measure of social relationships. Yet, the authors acknowledge the weakness of *their* ISEW:

> The arguments for the ISEW are not based on the discussion of economics for community that constitutes the bulk of [our] book. *They are based on contemporary mainstream economic discussion*. Of course, on disputed issues we have taken sides, and the side we take is the one that regards equitable distribution of income as an economic desideratum and pollution and resource exhaustion as economic liabilities. Further, we believe that policies directed to improvement as measured by the ISEW would lead in directions that economics for community calls for. [Daly and Cobb 1989:379, emphasis added]

In other words, according to Daly and Cobb (1989:379), the ISEW is derived from "contemporary mainstream economic discussion". The theoretical foundation should be discussed in light of this claim, as endeavoured in *Sections 3.3* and *3.4* below.

Nonetheless, the vision they have of a 'redirected community' must bring about the fundamentals of the theoretical framework for ISEW, and therefore include the flow of services from social capital, indeed all forms of capital. As they said, "*all economic decisions should serve the common good*" (Daly and Cobb 1989:105, emphasis added). This means that the success of policies designed to increase the aggregate of goods and services must not destroy or weaken the existing patterns of social relationships:

> Our dependence on others is not simply for goods and

> services. ... People also have some freedom to constitute themselves. Personal responsibility is based on that freedom. But this transcending of relationships does not introduce something separable from the social relationships. It can be only a partial transcending of just those relationships, and it is the quality of those relationships that makes real freedom possible[;] ... there is no reason to suppose that the *quality of relationships* constituting the society has been improved by the increase of commodities. [Daly and Cobb 1989:161]

Therefore, it is argued that the crux of ISEW is to determine whether the economy is supporting or destroying a healthy community. Community is more important than ever. ISEW is also a challenge to orthodox economics hegemony and the fetishism of GDP. But it does not ridicule existing institutions; rather it calls for the paradigm shift in which the "market can continue to play an important role within a context that sees the purpose of the economy *as the service of community*" (Daly and Cobb 1989:19).

3.3 Entropic Net Psychic Income

H2b: The ISEW is conceptually based on "Entropic Net Psychic Income":
(i) Psychic income and outgo flow from the capital stocks.
(ii) The notion of Fisherian Income is based on minimising consumption and maximising the service.
(iii) Depletion of the finite stock of ecological capital is an entropic process.
(iv) Sustainable economic welfare rests on the *optimal scale*.

In *The Nature of Capital and Income* (1906), Irving Fisher argued 'income' is the *enjoyable flow of services* from capital and human beings. He defines capital as a stock of wealth existing at an instant of time, and the income as a flow of services through a period of time (Fisher 1906:52). The service is a person's desirable satisfaction received from the use value of goods. Services are potentially brought about from the stock of capital. Hence, for Fisher, service (or 'income') is the essence of welfare, not necessarily the wealth itself.

As income is the flow of services that emerge from the use of capital, according to Fisher, in what sense is income the more elementary concept? It is in the widest economic sense; Fisher considers income to be *the* fundamental concept because as *psychic income* it refers to the "desirable events" that give "meaning to all economic phenomena". Hence, psychic or "subjective income" consists of *psychic satisfactions*,

namely those derived from the stock of final consumption; more accurately, the utilisation of artefacts. Here, we mean the ordinary meaning of 'consumption', durable and non-durable consumer goods as defined in the System of National Accounts (SNA).[61] Of course, other forms of capital/wealth potentially yield services or disservices.

Yet, a major part of the positive yield in today's production culture is ultimately derived from the stock of final artefact capital. For example, the leisure time engaged in listening to music usually involves a digital compact disc, an audio player and speakers. Under Fisher's conceptual framework of capital and income, the service is yielded when the use value of the item(s) is initiated. In this case, the psychic income is the final expression of enjoyment of the service, music. Leisure time is often needed to enjoy the service from artefacts, but if there is less leisure time then there is less enjoyment of the useful service.

Hence, the final personal *uses* of wealth, usually referred to as "consumption", are the only items that count towards the psychic income. In other words, the subjective services constitute the *gross* final income:

> The ultimate result is not finally received until it emerges in the stream of consciousness. ... [For example,] the final income consists of the subjective satisfactions of appetite and the other satisfactions which the intake of food enables the body to yield to the mind. [Fisher 1906:167,168]

However, there are negative income flows, i.e. the *psychic outgoes*, which need to be calculated. Under Fisher's accounting framework, "psychic costs" (e.g. Fisher 1937:30) or "psychic disservices" of the economic process can be separated into the worker's dissatisfaction of labour (and overwork), and all other disagreeable elements in a person's stream of consciousness (e.g. see Fisher 1906:170-5), such as stress or fear of crime. They are deducted from the gross (psychic) income to arrive at "*net* psychic income".

Net psychic income is the total subjective positive satisfactions from the use of food, clothing, furniture, dwellings (shelter), transportation, telephone communications, Internet services, the use of theatres, use of books and the uses of services of every other artefact, minus the undesirable subjective efforts put forth by human beings in order that these satisfactions may accrue (Fisher 1906:174, 1937:34). As in Eq. (3.3) below, net psychic income is equal to the sum of the 'psychic income'

[61] Nonetheless, we utilise the more neutral term, 'artefact', as in the stock of 'final artefact capital' instead of 'final consumption capital'. Artefact capital is what Fisher referred to as "objective wealth".

(ρŷ) minus the sum of the 'psychic outgo' (ρσ):

$$\begin{aligned} \textit{Net Psychic Income} &= \sum(\text{Psychic Income} - \text{Psychic Outgo}) = \sum(\rho\hat{y} - \rho\sigma) \\ &= \sum(\text{Psychic Services} - \text{Psychic Disservices}) \\ &= \sum(\text{Psychic Benefits} - \text{Psychic Costs}) \end{aligned} \tag{3.3}$$

Eq. (3.3) illustrates the different ways of expressing the "psyche"—i.e. all the corresponding terms (e.g. psychic income and psychic service) are equal. The key for hypothesis H2b(i), is that the nature of the income transactions are *psychic* based.

He considered *both* 'money income' and 'yield income' important (see Fisher 1939:357).[62] But obviously, the psychic definition of income is the most significant for ISEW. It is somewhat problematic when developing a set of national accounts based on so-called "objective social income" (i.e. *money income* available for society) to measure welfare. For money income, the net benefits of the economic activities would be difficult to calculate as all 'objective costs' are, always, 'objective income', and hence disappear in the final summation.[63] As Fisher says,

> every rent and interest payment, while it is a cost to the payer is income to the payee. The total objective income of society consists wholly of *positive* items[,] ... [t]here are *no negative items in the account of social income* which survive in the form of 'costs of production'. [Fisher 1906:174, emphases added]

That is, depending on the angle taken, the "costs of production" are equivalent to money income. A welfare measure conceptually founded on so-called objective (i.e. non-psychic) income is inherently biased upwards, because the negative psychic forms of income (outgoes, disservices, costs) are *not* included in the final transaction. According to Fisher (1906:174), the subjective income provides the correct interpretation of society's potential net welfare, as the costs *are psychic dissatisfactions* and the income flows *are the psychic satisfactions*.

Therefore, the ISEW is conceptually sound (H2b) because, in principle, it centres on *psychic service* adjustments, rather than non-psychic transactions. For example, psychic services flowing from final artefact capital, durable fixed capital, and non-market activities in the ISEW encompass, respectively, 'personal consumption expenditures' including consumer durables, government roads and highways, and household labour. But economic activity also generates irksome activities, for example, air and water pollution. The psychic outgoes/disservices/costs of the economic process are thus deducted in

[62] His meaning of income is 'services' or 'yield income' or simply 'yield'.
[63] Unless *all* costs to society were embedded in the production process, which is seldom the case.

ISEW; this is the second amendment. In essence, 'net psychic income' is the total satisfactions received from the use value of goods minus the undesirable or unwanted side effects from the production process. For other examples, see Philip Andrew Lawn (2003)—the first author linking the components of the ISEW to the net psychic income. Hence, the summation of the positive and negative flows of subjective income provides a good conceptual foundation for calculating the ISEW of a population through time (H2b(i)).

But there is a further important aspect of ISEW, 'sustainability'. The sustainable part of ISEW is the welfare a nation enjoys at a particular point in time *given the impact of past and present activities* (see Lawn 2006a). With respect to sub-hypothesis H2b, an important question arises: to what extent is this adjustment of sustainability vis-à-vis 'income', theoretically sound? An important point is that the measure of income based on the strong sustainability principle entails that *both* ecological capital and human-made capital must be kept intact.[64] This principle is critical because it implies that any increase of the quantity of human-made capital is unable to offset the depletion of ecological capital sufficiently to maintain a constant stream of income, or consumption, over time.[65]

However, Lawn (2006b) argues against Hicksian income even if it is a strong sustainability version, and focuses on Fisher's concept of income and capital to develop the Sustainable Net Benefit Index (SNBI), providing theoretical support for ISEW and the Genuine Progress Indicator (GPI). In short, according to Lawn, the problem is that Hicksian income wrongly associates economic welfare with the *rate of production and consumption*. By keeping capital and income separate, Fisher's notion forces one to recognise that since the stock of human-made capital depreciates and wears out through use, its continual maintenance is a cost not a benefit because:[66]

> the maintenance of human-made capital requires the production of new goods that ... can only occur if there is an ongoing throughput of matter-energy (the input of low entropy resources and the output of high entropy wastes). This ... results in the inevitable loss of some of the source, sink and life-support services provided by natural capital—the uncancelled cost of the socioeconomic process. [Lawn

[64] Human-made capital refers to all producer and consumer goods but also "labour" in Lawn (2003).

[65] That is, ecological capital (resource assets, ecosystem services etc.) and physical capital (producer goods such as plant, machinery, and equipment) are perfect or near-perfect complements. For various reasons, according to Lawn, ecological and human-made capital are non-substitutable (see Lawn 2006b:20-1).

[66] Human-made capital refers to all producer and consumer goods but also "labour" in Lawn (2003).

2006b:37]

The distinction between income and capital via Fisher has an important result: that the production to replace worn out human-made capital is a cost; this is because throughput is a cost-inducing physical flow.[67]

The implication for the sustainable part of ISEW is that the 'maintenance cost of human-made capital' is *not* a "psychic" cost *per se*, but a different type of cost, the *depreciation flow of ecological capital* (H2b(iii)). Why? Lawn and Sanders (1999:215) argue that the process of transforming a portion of ecological capital into artefact wealth is a perpetual task, because the capacity of an individual item to satisfy human desires is eventually lost, i.e. the artefact is either consumed or through use, wears out. Consequently, according to Lawn, satisfaction of human needs—the psychic income—ultimately depends on the *original* source of all economic activity, ecological capital.[68] Lawn (2001:80), in agreement with Boulding (1966c), says that only the service-yielding qualities of human-made capital, *not the rate* at which human-made capital is consumed, should be maximised. If the same level of service can be enjoyed from less consumption, this would be a gain because it would require less production to maintain the stock of human-made capital intact. While it is necessary to consume human-made capital to enjoy the net psychic income, consumption should be viewed as "a necessary evil" and something to be minimised.

Therefore, consistent with Lawn and Sanders, there are two major types of *final* transactions in the ISEW: 1) the "uncancelled benefits" (the net psychic income); and 2) the "uncancelled costs" (the depletion of ecological capital). Firstly, the cancelling out of psychic disservices or 'psychic outgo' from psychic income enables one to obtain a measure of *net psychic income*—the final or the so-called 'uncancelled' benefit of economic activity:

> Net psychic income is the uncancelled benefit of economic activity because, in tracing the course of economic activity from its source (natural capital) to its final, psychic conclusion, every intermediate [monetary] transaction involves the cancelling out of a receipt and expenditure of the same magnitude [i.e. the seller receives what a buyer pays]. Only once *an item of wealth* is in the same possession of the final user or consumer is there no additional exchange and, therefore, no further cancelling of transactions (Daly, 1979: p. 81). [Lawn and Sanders

[67] The *throughput flow* does not yield services directly; it must be accumulated and fashioned into a stock of useful artefact capital.

[68] "This is because natural capital is the sole source of low entropy matter-energy and the ultimate repository of all high entropy wastes" (Lawn and Sanders 1999:215).

1999:215]

Secondly, the loss of ecological capital services constitutes the final or "uncancelled cost" of economic activity:

> [N]o matter how benignly human beings conduct their activities, the subsequent disarrangement of matter-energy always has some deleterious impact on the natural environment. ... [H]uman beings have ... to ... accept some loss of the free source-sink and life-support services provided by natural capital[;] as some portion of the low entropy it provides is transformed into physical commodities and returns, once they have been consumed, as high entropy waste. [Lawn and Sanders 1999:216]

Hence, the ISEW is equal to the uncancelled benefits minus the uncancelled costs.

In summary, apart from artefact capital itself, what remains at the end of the process is the uncancelled exchange value of the psychic income the consumer expects to gain from the artefact, plus any psychic disbenefits associated with the artefact's production (H2b(i)).[69] In addition, there are the ecological capital services sacrificed in the process of accumulating the artefact capital—the "final or 'uncancelled' costs" of economic activity to keep the stock of human-made capital intact (H2b(iii)). Therefore, ingrained in the Fisherian notion of income and capital (H2b(ii)), ISEW is theoretically a measure of *entropic net psychic income* (H2b). That is, ISEW is equal to the net psychic income ($\eta\rho\hat{y}$) minus the depreciation of ecological capital (δE_K), as in Eq. (3.4) below[70]:

$$\begin{aligned} \text{ISEW} &= \text{Entropic Net Psychic Income} \\ &= \sum(\text{UBenefits} - \text{UCosts}) \\ &= \eta\rho\hat{y} - \delta E_K \end{aligned} \tag{3.4}$$

Where:
UBenefits = Uncancelled Benefits
UCosts = Uncancelled Costs
δE_K = Depletion of the Stock of Ecological Capital
$\eta\rho\hat{y}$ = Net Psychic Income = UBenefits = (3.3)

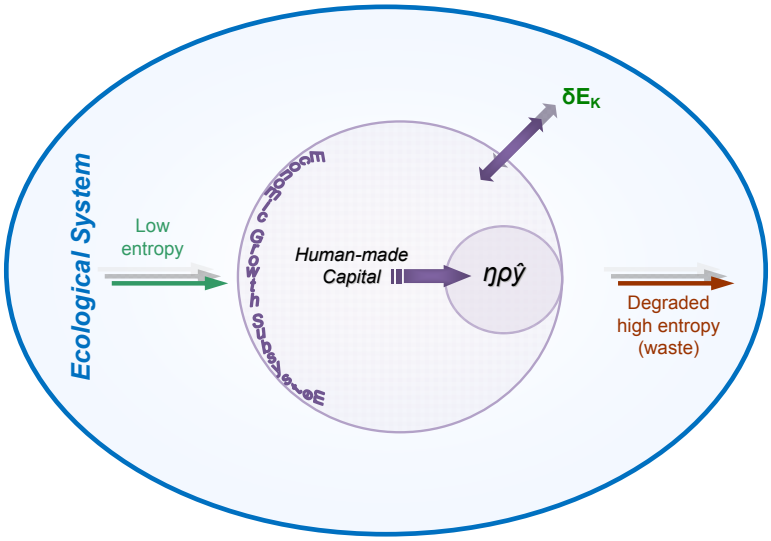
In relation to sub-hypothesis H2b, the ISEW is conceptually sound as it interweaves sustainability and service to arrive at a measure of *entropic net psychic income*.

The entropic net psychic income (ISEW) can be portrayed below as

[69] If the psychic costs are subtracted from the good's final selling price, the difference constitutes the 'use value' (see Lawn 2005:189,192).
[70] An additional assumption employed in Eq. (4) is that the value for consumption expenditure is weighted according to changes in the distribution of income over time (e.g. see Lawn 2006b:27).

follows. The production process is dependent on the durability of the capital stocks, especially ecological capital. Capital stocks are open systems whose maintenance requires a continual exchange with the environment, a continual throughput of matter-energy. *Figure 3.2* below illustrates the economy as an open subsystem in the larger biophysical system subject to entropic processes, and that the economic growth is inextricably linked with ecological capital for services including atmospheric conditions and natural resources:

Figure 3.2. The Conceptualization of Entropic Net Psychic Income



In *Figure 3.2* above, '*net psychic income*' (*ηρŷ*) flows from the stock of '*Human-made capital*' in the '*Economic Growth Subsystem*'.[71] The economy is reliant either directly or indirectly on ecological capital such as natural resources, biodiversity and sinks for its continuance and reproduction. But, growth of economic activities generates high entropy (waste, degraded form of energy) and can disrupt biological relationships, i.e. as the economy expands there is loss of ecological capital services (δE_K). (The purple arrow on the corner angle of the economic growth subsystem illustrates this.) This happens because the ecosystem and economy are interdependent, i.e. in relation to hypothesis H2b(iii), the economy is entrenched in an ultimately finite ecosystem.

In order to measure the entropic net psychic income, it *might* therefore be necessary to base the ISEW on some sort of *optimal scale*. Thereby leading to hypothesis H2b(iv). Lawn adopts Daly and Cobb's (1989) ISEW notion of 'optimal scale', albeit *without* an "economics for community" framework.[72] Sustaining the optimal stock of human-made

[71] *Ų = Ecological System* = {Low entropy, Degraded high entropy, δE_K}. '*Human-made capital*' is the '*Economic Growth Subsystem*' minus '*ηρŷ*'. *Economic Growth Subsystem* ⊂ *Ecological System*.
[72] See *Section 3.2* for Daly and Cobb's "economics for community" framework.

capital requires the following: 1) A continued source of low-entropy resources; and 2) the continued availability of a high entropy waste-absorbing sink. In effect, according to Lawn, the ecosphere has a limited carrying capacity—the ecosphere is *both* the primary source of low entropy as well as the sole high entropy waste-assimilating sink (see Lawn 2001:49). In view of hypothesis H2b(iv), there is simply a need to ensure that in attempting to increase or maintain the structural organisation of macroeconomic systems, the ecosphere's source and sink functions remain intact. The conclusion with respect to sub-hypothesis H2b is that ISEW is based on a strong theoretical foundation, entropic net psychic income.

3.4 Social Welfare Function – Maximising the Net Benefits of Economic Growth

H2c: Utilising some principles of welfare economics, the ISEW is theoretically based on a "Social Welfare Function":

(i) *Decision utility* is a function of consumption expenditures (GDP).

(ii) (A) Social choice, (B) partial comparability, and (C) cost-benefit analysis can be fused together to construct a workable *social welfare function*.

(iii) Negative social and environmental *externalities* can be calculated by *compensatory or defensive expenditures*.

(iv) *Systems analysis* is imbedded in the adjusted-GDP indicator to assess the *net benefits of economic growth*.

Welfare economics is concerned with ordering different social states and determining whether people are better or worse off over time. Welfare has economic and non-economic components. "The economic welfare of the country is intimately associated with the size of the national dividend, and changes in economic welfare with changes in the size of the dividend" (Pigou 1932:50). Outside the market place is "non-economic welfare" such as the character and passion of a human being, love and the beauty of nature (Pigou 1932:11-4). Hence, ISEW depends on the provision of welfare components from the market *and* non-market contexts. The principle of maximising social welfare is essential to the ISEW (Clarke and Islam 2004:11).

ISEW (version three) is based on *some* of the principles of welfare economics.[73] One of the fundamental assumptions of welfare economics is that "[t]he economy is geared mainly towards improving human welfare, primarily through increases in the consumption [expenditures] of goods and services. ... Economic progress is evaluated mainly in terms of

[73] For example, the assumptions of the "fundamental theorems" are *not* incorporated in the ISEW. This is a good thing (e.g. see Blaug 2007).

welfare (or utility)—measured as willingness to pay for goods and services consumed" (Islam *et al*. 2003:150,152). The authors argue that there are legitimate economic reasons for using GDP as a limited measure of social welfare (see Clarke and Islam 2003:3, 2006:221). At an aggregate level, GDP is the summation of all individuals' revealed preferences for particular consumption bundles. "Just as revealed preferences can indicate whether the welfare of an individual has increased or decreased, thus, so too can GDP indicate this for the entire economy" (Clarke and Islam 2004:49). When people buy goods or services, they *generally* do so because they believe that their purchase will leave them in some way better off. That is, after deducting the actual purchase price, there will be some residual or net value. The revealed preference is known as "decision utility".[74] Decision utility is the starting point of the ISEW (H2c(i)).

However, individual preferences are not necessarily welfare (or utility) enhancing choices. "Choices are not made within a framework of stable, pre-existing, limitless cognitive capacity, certainty, and full knowledge of the choices faced by others[.] ... [I]t cannot be assumed that individual preferences revealed within the market place can be aggregated to reflect socially optimal outcomes in terms of social welfare" (Clarke and Islam 2004:13). There are valid reasons for doubting the worth of individual valuations. Mishan and Quah (2007:245-6) say that within a modern growth economy in which the 'Joneses effect' is discernible, there is an "[i]ncipient fragmentation of a consensus about the propriety of consumer goods and activity". Similarly, as noted by Clarke and Islam (2005b:184), "newly acquired affluence (particularly in developing countries) may lead to less healthy diets based on conspicuous consumption of fatty or high cholesterol foods, increased rates of smoking and alcohol use, etc., which all may reduce health outcomes—despite higher levels of income". Much evidence suggests that society can have little confidence that the valuations people place on goods have a close association to their decision utility or subjective wants (Ng 2003, Sagoff 2003). That is to say, the individual choice and their decision utility can be at odds with the welfare optimising *social choice* (H2c(ii)(A)).

"Social choice" is about relating social judgements to the views and interests of the individuals who make up the society. Evaluating the "social choice" is critical for the theoretical and methodological foundations of the ISEW, albeit it is somewhat controversial. Arrow (1951) demonstrated that it was impossible to satisfy a set of axioms of reasonableness to make a non-dictatorial social choice. He proved that a social welfare function could not be constructed, because there would be failure in one of four "reasonable" assumptions of transitivity; the Pareto

[74] For a good literature review on the different types of "utility", see Daniel Read (2007).

Criteria; independence; and democracy. However, these "reasonable restrictions" were unreasonable as they ruled out by assumption *interpersonal comparisons of welfare*, i.e. the ability to weigh the gains of winners against the losses of losers (see Sen 1966, 1970a, 1970b, 1997). The strict extremes of "full comparability" and "no comparability" are not that useful. This demands "partial comparability", which will be effective for making social decisions or generating an 'optimal' choice (H2c(ii)(B)).[75] "We may be able to make interpersonal comparisons to some extent, but not in every comparison, nor of every type, nor with tremendous exactness" (Sen 1999:356). With the use of interpersonal comparisons in *social welfare judgements*, Arrow's impossibility disappears. Hence, the empirical exercise for the ISEW need not be as daunting as it is sometimes believed.

Undertaking social judgements in welfare economics has theoretical roots (H2c(ii)(A,B)). Abram Bergson (1938) noted that a socially optimal mix of goods and services would need to personify social welfare judgements of distributional justice, or, fairness. Similarly, others, such as John Rawls (1971), also questioned the utilitarian neglect of distributional issues. Therefore, incorporating principles of equity is imperative for the social welfare function based on a social choice framework (Slesnick 1998:2149). An unequal distribution has implications for social welfare (ISEW). Thereby, the social choice of adjusting consumption for inequality and accounting for intergenerational equity is acceptable. At a conceptual level, the social welfare function for ISEW embodies relating social preference (or decisions) to the set of individual preferences. Individual preferences will not achieve optimal social welfare outcomes, e.g. with regard to certain concepts, such as sustainability, because the environment is a public good (see Clarke 2006a:153). The use of interpersonal comparisons allows public decisions to be sensitive to inequalities in well-being and opportunities, here, we are "emphasizing the possibility of constructive social choice theory" (Sen 1999:365).

Normative social choice theory incorporates the various social concerns about welfare that are inadequately captured using individual preference satisfaction techniques in the market place (Clarke 2006a:153, Clarke and Islam 2005a:86). For ISEW, social choice extends this consensus from the individual/household to the society:

> By operationalising social choice theory, society's choices, preferences and value judgements on issues of economic equity and efficiency, intergenerational equity, aggregation, value judgements, justice, poverty, measurement and

[75] Yet, even when an optimal alternative does not emerge, it can help to limit the set of undominated alternatives to which a 'maximising choice' can be confined (Sen 1993).

> market perspectives versus social perspectives are considered. [Clarke and Islam 2004:14]

The conceptual/methodological framework for estimating ISEW is thus a social welfare function derived from the principles of normative social choice theory, where undertaking widely-acceptable value judgements. Social choices are made through institutions, such as parliamentary democracy or the free market, not abstract mathematical aggregations (e.g. Just *et al.* 2004:8-10,579). They can be estimated by many methods, such as by using expert (or analyst) opinion, government formulated public policy, or willingness to pay, hedonic prices and contingent valuation methods. This clarifies the problem of designing a workable social welfare function.

With social choice theory, an optimal social outcome is possible by imbedding social preferences within a *cost-benefit analysis* (H2c(ii)(A,B,C)). Boadway and Bruce (1984) argue that cost-benefit analysis is a useful framework to rank social states (or projects) when the forces of private profitability are unable to rank according to social orderings (see Clarke and Islam 2004:61). Cost-benefit analysis in ISEW entails assigning monetary values (such as shadow prices) to the various "economic" and "non-economic" costs and benefits of economic growth (Clarke and Islam 2003:5). The economic transactions are market-based, while the non-economic are the effects that are not captured elsewhere in the economy. All these impacts are summed for each period and all these current values are converted into a present value. This is achieved with time preferences and social discount rates (see Boadway and Bruce 1984). Note that the ISEW is predominantly concerned with *socioeconomic and environmental* costs (and benefits) to society.

These costs are also referred to as *negative externalities* or *external diseconomies* (H2c(iii)). In the 1920s, Pigou (1932:183-92) effectively developed the concept of "externality" by arguing that there is a disparity between private economic production and public economic product—alluding to child labour, maternity leave for working mothers, alcohol, war and factory production. The problem of externalities is those unintended consequences of choice, i.e. choices that bring benefits only at the expense of certain (often-unanticipated) costs. All external effects, positive or negative, have two properties: interdependency and lack of compensation (see Barkley and Seckler 1972:7,101). For example, the major theme of Mishan's (1967) essay in *The Costs of Economic Growth* was the salient factors responsible for the growing incidence of external diseconomies imposed on the public at large by modern industries, which thereby increase pressure on life. These are large enough to be obviously in need of remedial correction. He was critical of economists engrossed in mathematical models of growth *while* ignoring the events

taking shape around them, such as the social tensions generated from the production process, poisoned rivers from chemical effluent, or the 'uglification' of coastal towns. He could not see private enterprise embedded in the existing institutional framework solving growth problems. For instance, the firm does not take into account the overflow effects on the city's traffic when it decides to construct additional floor space or demolish old buildings in order to build taller ones while settling in a crowded city. Mishan (1967:110) notes how strange our kind of civilisation is which leaves initiative in designing our cities, fragmentary, for the most part to commercial interests, and their approval to frugal councillors. And we do so at a time when, with more evidence than before in history, pecuniary instincts are dominant—e.g. the ascendancy of financial capital in the various stock markets since the 1970s, manifesting speculative bubbles during the 1980s–2000s.

Given these widespread negative externalities, the longer-term development of net income or net product in an industrial economy is of significance for welfare theory: Does the growth of national product arise parallel to the growth in consumption opportunities? Or: Has the production process made possible over time an increase in net consumption? The notion of *compensatory expenditure* can aid our understanding of the 'net income' or 'net consumption' of the economy—i.e. estimating the negative externalities with reference to the rise in consumption expenditures. Christian Leipert explains the theory of compensatory expenditures:

> The production and consumption process has, over time, *unequal* positive and negative effects on the living, environmental, and working conditions of the people. Some of these negative side-effects now lead to economic activities aimed at eliminating, reducing, or neutralizing them. ... The associated expenditures are, seen in the longer term, *additional* costs, which, in contrast to the *initial* period on which the comparison is based, are *essential* for the production of the actually desired consumption and investment goods. [Leipert 1986:115]

The time–space consideration is important here. In the short term, compensatory expenditures are both necessary and useful. But in the longer-term, the additional external costs and expenditures must be accepted by society when a particular development and settlement pattern has become established.

Note that compensatory or regrettable expenditures are effectively "defensive expenditures". These are welfare-maintaining outlays that are necessary to defend and protect ourselves from the unwanted side

effects, or the costs, of production and consumption (see Leipert 1989a:844). He provides many examples of compensatory/defensive expenditures that correspond well to ISEW. For example, the clean-up and repair costs associated with automobile accidents, and the expenditures resulting from increased levels of pollution causing ill-health and stress.[76] "Seen from a dynamic perspective, defensive expenditures are additional macroeconomic costs incurred by a specific growth and development pattern" (Leipert 1989b:28). With a "welfare-orientated revision of the GNP, a more comprehensive and refined measure of the *real net consumption* of private households may be obtained" (Leipert 1986:119). This "real net consumption" indicator *is* the ISEW. Finally, the critical thing, "[c]ompensatory expenditure categories ... permit... qualitative judgments" (Leipert 1986:120). In relation to hypotheses H2c(ii,iii), this is significant for the ISEW enshrined in social choice theory/cost-benefit analysis.

It is argued that the ISEW is theoretically based on a social welfare function (H2c). Social welfare (SW) is a function of only part (d) of economic growth (EG), and consumption (CONS) is a function of economic growth:

$$SW_t = f(dEG_t)$$
$$EG_t = f(CONS_t)$$

That is, consumption is a major *positive* component of economic welfare. Islam and Clarke (2002:202,203) effectively say that tastes and preferences are considered unchanged over time.[77] This means that conspicuous consumption is not significant in the conceptual framework of the ISEW, but it may be taken into account *indirectly*. Besides, in theory, only a certain fraction of consumption is utilised because of the inclusion of non-welfare-increasing compensatory expenditures. The actions that destroy the range of consumption-expenditure choices are the focal point of the ISEW. Accordingly, social welfare can be considered a function of the positive (B) and negative (C) aspects of economic growth (EG):

$$SW_t = f(B\{EG\} - C\{EG\}) \tag{3.5}$$

GDP is normally a criterion of a social welfare function, yet GDP calculates the impacts of all economic activities, positive or negative (Clarke and Islam 2003:6). However, this particular social welfare function considers the benefits *and* costs of GDP. "The use of cost-benefit analysis allows the new measure of welfare to increase and

[76] Economic growth causes health externalities (see Clarke and Islam 2005b:182,183, 2006:224). The preferences or utility of agents do not internalise the costs or externalities of economic choices.

[77] But, *endogenous* preferences are critical for welfare analysis (e.g. see Bowles 1998).

decrease as both costs and benefits of economic activity are now included, rather than just the benefits" (Islam and Clarke 2002:212-3). Hence, Eq. (5) is not the sum of individual welfare but a function of the costs and benefits of economic growth.[78]

The per capita ISEW is also known as an "adjusted-GDP" measure (H2c(iv)). Islam and Clarke (2005:293) argue that "by utilizing social choice theory and systems analysis, it is possible to adjust GDP so that it does become an indirect indicator of sustainability and social welfare". (The assumption by the authors is that the national accounts are useful and valid for measuring welfare.) The key thing is that "sustainability is reliant upon a functioning and robust socio-economic environment system" (Clarke and Islam 2006:225). Hence, the interest is the "social, economic and environmentally adjusted GDP (SEE AGDP)". SEE ADGP *is* the ISEW, as shown in Eq. (3.6) below:

$$\text{ISEW}_t = \text{SEE AGDP} = \sum_{t=1}^{T} \frac{\eta B_t(\text{Ec}_t, \text{Env}_t, \text{Soc}_t, \text{Pol}_t, \text{Spir}_t)}{(1+r)^t} \qquad (3.6)$$

In Eq. (3.6), the maximisation of present value of the net benefits ($\eta B = B - C$) of economic growth—i.e. benefits from decision utility minus the costs of the SEE damages caused by economic growth.[79] According to Clarke and Islam (2004:49,63), the social welfare function includes five components of a SEE system. The components of a SEE system include the economic (Ec), social (Soc), political (Pol), environmental (Env) and spiritual (Spir) sub-systems (see Clarke and Islam 2003:7,9). As social welfare is a function of the entire SEE system, ISEW takes into account changes within each subsystem.

More specifically, what is the relationship between the system and the ISEW? According to the authors of SEE AGDP, society is made up of many subsystems that inter-relate in a dynamic manner[80]:

> [S]ociety is systems based[,] ... one sub-system of many that in total make up society. ... Society is a complex system, of which the economy is only one sub-system. ... By implementing a systems analysis view of society a more developed understanding, and consequently measure, of welfare can be achieved. [Clarke and Islam 2004:22,33,71]

[78] The authors provide interesting examples of the market and the social choice perspectives vis-à-vis the various subsystems in Chapter 4 of *Economic Growth and Social Welfare*.

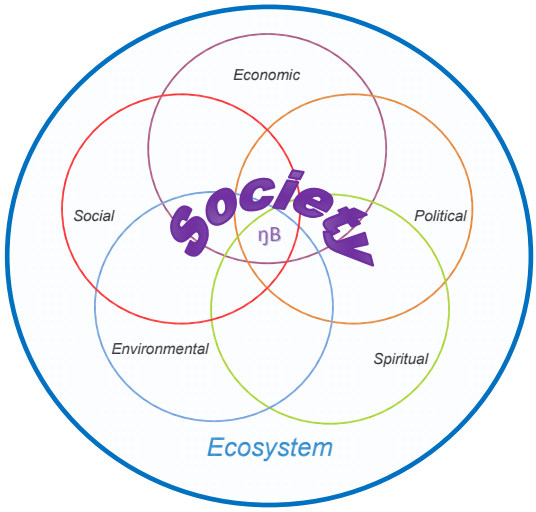
[79] Note that in the Thai ISEW, "[t]he reference set is endogenous in the sense that the decisions made by the present generations will impact on whom future generations will actually be" (Clarke 2003:97). For pragmatic reasons, Clarke (2003:99) uses a social discount rate equal to zero. This means that the needs of the present generation are explicitly made equal to the needs of the future generations.

[80] For example, see Clarke and Islam (2005b:185), Islam and Clarke (2005:286), and Islam *et al.* (2003:152).

In other words, sustainability cannot be measured in static terms. "A divergence between the GDP and SEE AGDP indices is an indirect indicator of unsustainability, as the robustness and health of the socio-economic and environmental system is decreasing" (Islam and Clarke 2005:289). The *trend* of SEE AGDP provides a partial measure of 'sustainability', as "sustainability is a property of the path the economy is on and not of the state of the system at any given time" (Atkinson *et al.* 1997:62). Therefore, ISEW or SEE AGDP is potentially useful for intertemporal and interspatial comparisons of welfare (H2c(iv)).

However, the actual relationship between the system and ISEW remains unclear. For instance, *Sustainability: A Systems Approach* by Clayton and Radcliffe (1996) is a key reference frequently cited by Clarke and Islam to justify—*albeit without much explanation*—the "systems-analysis" in SEE AGDP. Hence, to make this theory somewhat coherent, the authors' work is supplemented. A systems approach to sustainability entails considering the various agents interacting in the world as systems (Clayton and Radcliffe 1996:13,17). In this case, the key system is 'society', which comprises the economic, social, political, environmental and spiritual sub-systems (i.e. *Ec*, *Soc*, *Pol*, *Env*, *Spir* spheres in Eq. (3.6)). And the delineation of the system boundary of 'society' is the 'ecosystem', as shown in *Figure 3.3* below:

Figure 3.3. **The Net Benefits of Economic Growth with Society Embedded in the Ecosystem**



The point of intersection determines the *net benefits of economic growth* (ηB) in *Figure 3.3* above, where all the benefits and costs of the subsystems are aggregated.[81] When net benefits of economic growth are

[81] '*Society*' is the union of the five subsystems in Eq. (6): *Society* = *Ec* ∪ *Soc* ∪ *Pol* ∪ *Env* ∪ *Spir*. *Ų* = *Ecosystem*. *Society* ⊂ *Ecosystem*. Note that 'Benefits' and 'Costs' are elements of '*Society*'. 'ηB'

increasing over time, the area of ŋB is larger. When they are decreasing over time, ŋB-area is smaller. A functioning and robust SEE system is partly determined by the interconnectedness (or proximity) of the spheres. And the extent of the interconnectedness is signified by the degree of divergence between the GDP and SEE AGDP indices. Society is making progress when the spheres are becoming more 'connected' or 'closely knitted': ŋB-area is larger (increasing) and ultimately the ecosystem is less exploited over time. Society is regressing when the subsystems are becoming disconnected: ŋB-area is smaller (decreasing) while the ecosystem is being depleted. Hence, in *Figure 3.3,* the ultimate constraint of societal development is the ecosystem, as 'society' is embedded in the ecosystem.[82]

Disaggregating the spheres into a subsystem (of society) is useful and thereby the discrete contribution of each aspect to social welfare can be identified. However, an influential assumption in the SEE AGDP is that the division of the aggregation does not affect the operation of the parts. That is, the summation of the various subsystems constitutes the whole.[83] This can be a problematic assumption. Moreover, the subsystems of society are drawn in similar dimensions at inert positions. But the real disposition of the society is determined by factors that are much more complex: the subsystems are of uneven spatial size and are continually moving in multiple directions. The important thing, as Clayton and Radcliff (1996:22) state, is that the "essential system structure" is captured in the model (e.g. *Figure 3.3*), and that the structure of the model reflects the rudiments present in reality. A preliminary question arises. How well do the ISEW theories describe the real makeup of society, i.e. the "essential system structure"? Indeed, this is a critical question as the conceptual foundation of the ISEW depends on it. The following section elucidates this matter.

('Benefits' minus 'Costs') is equal to the intersection of the five subsystems of '*Society*'. '*Society*' = Benefits – Costs = *Ec* ∩ *Soc* ∩ *Pol* ∩ *Env* ∩ *Spir.* Interconnectedness of the subsystems = *Society* – area of ŋB.

[82] Apparently in Clarke and Islam (2005a:85), the *social* sub-systems of the "ecological parent system" are the economic, social, environment, political and spiritual. Overall, however, in Clarke and Islam (2004), *society* is the primary sub-system vis-à-vis the "ecological parent system", mentioned on p.16 (three times), p.22 (twice under section "2.2.4.3 Systems Approach"); and p.33 (three times). Note that the "optimal well-being of society" is referred to "human" or "social" well-being (Clarke 2006a:158,162).

[83] To approach the problem of complexity, so-called sophisticated reductionism is employed. Simplicity in ISEW construction involves dealing with aggregates and averages, and by treating units (e.g. monetary) as equivalent and interchangeable.

3.5 Conjectural Problems of the ISEW: Abstracting from the Disembedded Economy?

Now that the three underlying theories of ISEW have been presented, it is time to critically evaluate—as referred to by Schumpeter (1911)—the "preanalytic vision" of each analysis. The preanalytical vision informs our perceptions and interpretations of the reality. That is, the things deemed *desirable* and the things deemed *possible* were invariably preselected by our (their) own place of analysis. Of interest is the different ways in which the theories attempt to describe the relationship between the spheres of economy, society and ecology. Evidently, the link between economy and ecology is well developed by ISEW advocates. Generally, the theories are consistent in portraying economic activity as a dominant and contradictory subsystem of the ecological system. But the descriptions of society or the social sphere are contrasted and the explanations are somewhat vague. In the oikonomia model, the economy is a subsystem of community. In the social welfare function, the social and economic systems make up (in part) the dynamics of society. In the entropic net psychic income version of ISEW, society and community are underplayed, i.e. communicated less importantly than they really are.[84] Why are there gaps in the theory of society/the social system? Indeed, how large are the gaps? These are surprising results, given that the advocates of ISEW espouse *concreteness*, i.e. "being real, being identified by experience, not abstraction" (O'Hara 1995:540). It becomes necessary to consider the "real" relationship between economic activity and its ecological *and* social context.

Social factors are interwoven with economic growth (see Hagen 1972:53). Successful social growth in *any* society depends on a set of qualitative standards of (sustainable) development. *Any* society needs a certain amount of special force, energy, and insight to put forward a new technical, artistic, social or technological combination. It is the role of the entrepreneur to actuate these combinations. Furthermore, not only does society need resources, labour, knowledge, savings, investment, and enterprise, but a *social ideology* that will permit all these factors to operate together. As David Wright (1951:37) argues, "[a] favourable cultural atmosphere is one of the most important and one of the most usually overlooked requirements for economic growth". However, the basic problem of change constantly recurs: "it is the task of *balancing* sets of qualities never wholly harmonious yet all indispensable for successful civilization" (Wright 1951:38, emphasis added).

[84] There is an argument that social and communal dimensions are indirectly captured in psychic income, since in theory it captures subjective dimensions of entropic income that go beyond objective measures of environmental impact. Even though valuations may be individually based, they are not completely devoid of collective values and goals. Instead, the ISEW (version two) simply captures quantitative valuations of such impacts.

According to Sabine O'Hara (1998:177), sustainability is defined as "economic activity which sustains the material world and the biological, ecological and social processes which describe it". Sustainability requires that no less than three types of material constraints be considered: (1) sustaining individual physical needs; (2) sustaining social relationships; (3) sustaining biological and ecological services. Each of these three areas of sustainability requires at least three types of services: technological services, relational services and ecosystem services. She writes, "[t]he challenge is that their provision is not mutually compatible but *in tension*. Consideration of the material context of economic activity thus requires seeking a *balance* between the technological, relational and ecosystems services which can both support and undermine it" (O'Hara 1998:178, emphasis added).

Therefore, a major qualification for sustainable economic welfare entails the moderation of discordant forces within and between the spheres of economy, society and ecology—but this 'balancing act' is ultimately constrained by the dominant social ideology. Yet these prerequisites are disembodied in the ISEW analyses, because in their preanalytical vision the authors are embracing the things deemed *desirable* over the things deemed *possible*. Conceptually, that is, ISEW advocates focus on describing *what society wants* (e.g. service, psychic income or social welfare) more willingly than on *how society works* (i.e. in tension with economic activity). Describing *society in the system that we currently have* is the critical thing in political economy. We are going to show that the theoretical particulars of ISEW are not as well developed as they should be, viz. sub-hypothesis H2d below:

H2d: The theoretical particulars of the ISEW misplace concretely the workings of the capitalist system:

(i) 'Capital', 'service' and 'society' are viewed largely as separate from a specific *socioeconomic system*.

(ii) Economic relationships tend to dominate other aspects of culture in the *disembedded economy*.

(iii) The political economy of the disembedded system provides an alternative theoretical approach to the ISEW.

The theories of ISEW need radical reconstruction. There are major limitations in the capital/income approach to sustainable development as construed by ecological economists, i.e. Daly and Lawn. They have a tendency to view 'capital' and 'service' as largely autonomous of a specific *socioeconomic system* (H2d(i)). In these two theories, the basic institutions of capitalism remain unchanged, as do the fundamental relations of power. Their notions require a shift in lifestyle and consumer orientation; the economy is no longer geared to economic growth and the enlargement of profits, but to efficiency, equity, and qualitative

improvements in life. A capitalist society formerly driven to expanded reproduction through investment of surplus product (or surplus value) has been replaced by a system of simple reproduction of service or psychic income, in which the surplus is consumed rather than invested. John Bellamy Foster (2005) writes, "[t]he vision is one of a cultural revolution supplementing technological revolution, radically changing the ecological and social landscape of capitalist society, *without* fundamentally altering the productive, property, and power relations that define the system" (Foster 2005:9, emphasis added).

Similarly, as put forward by Martin O'Connor (1994:126), instead of nature being "treated as an *external* and exploitable domain", it is conceived as "self-management and conservation of the *system of capitalized nature* closed back on itself". In this fashion, "the *reproduction of capital* [becomes] *synonymous with saving nature*—[t]he planet as a whole is our capital, *which must be sustainably managed*" (O'Connor 1994:32-3). The 'sustainable development' issue is thus structured in terms of the ontological predominance of the economy (mainly the market) *or* nature. The tension between capitalism's specific material requirements and the requirements of a healthy coevolution of humanity and nature is not considered. That is, the ISEW theories do not realise that capitalism is a multifarious socioeconomic system with contesting ideologies, values and beliefs—made the more difficult with contradictory relations and vested interests deeply-rooted (O'Hara 2005).

More specifically, capitalism is not a distinct homogeneous and transferable arrangement, and does not offer a plain definition of material requirements and their conflict with co-evolutionary human social and environmental systems. Instead, capitalism has numerous manifestations, with the US and UK on one end of the spectrum and the Scandinavians on the other. For instance, neoliberal market economies (e.g. Australia, Iceland, UK and US) coordinate economic activity through markets and corporate hierarchies, whereas coordinated market economies, such as Germany and Sweden, coordinate economic activity more through nonmarket mechanisms, such as informal networks or corporatist bargaining (Campbell and Pedersen 2008:307-8). Their different manifestations of capitalism and their market vs. public sector vs. civil society economic components result in varying degrees of material impact (resulting from different degrees of regulatory boundaries to the market and capitalist system). This is precisely why capturing institutional, context specific arrangements in the ISEW theories is such as a challenge.

According to Paul Burkett (2006), the problem is that the ecological capital synthesis—especially the notions of entropic net psychic income and the social welfare function—does not attempt to connect itself to the social relations of particular economic systems (H2d(i)). It also does not

attempt to elucidate the systemic reproduction requirements of sustainability in some broader ecological and human developmental sense. Burkett (2006:121) insists that "[o]utside a social-relational vacuum, the issue is not how natural we want to be, but whether we are willing to fight for the kind of social system that promotes a healthier, more well-rounded form of human-ecological cultivation and renewal, that is of human development". Therefore, a holistic vision of the system is required to ascertain the destruction and creation of capitals and services. What is needed is a critical analysis of how capitalist relations generate material and immaterial dynamics that are anti-ecological, while also potentially engendering new non-capitalist forms of development that are pro-ecological, pro-social, pro-moral and pro-individual (of the person). "Sustainable development needs to be seen as development in, against, and beyond capitalism" (Burkett 2006:130).

Moreover, the paradox of "sustainable development" must be understood in the milieu of the integrated global, regional and national capitalist system. Accounts of the transition to a "knowledge economy" tend to understate the degree to which material production and pollution have migrated around the planet, rather than disappearing from it. For example, high-growth of Asia's "brown cloud" and emerging energy problems chiefly suggest that the West's relatively cleaner air and lower fuel costs are due more to heavy industry's migration than its de-materialization (see Nolan *et al.* 2004). So there is a tendency for only moderating environmental problems to the extent that they do arise in the short term, which cannot be at the expense of much less growth and consumption (Foster 2002).

We are in an age of globalisation characterised by global interdependencies. A fundamental power shift toward China is resulting in a transition from a unipolar, United States and Western dominated world order, to a multipolar power constellation with the US and China as the main foci (Gu *et al.* 2008:275). As noted by Chan *et al.* (2008:292), what China does or does not do in the environmental field will increasingly exert a global impact owing to its sheer aggregate size and increasing integration with the rest of the world. This suggests an intimate relationship between China's ecology and the global ecology, and between China's domestic governance and its global governance in environmental affairs. The advanced capitalists are fully implicated in China's ascendancy, i.e. Chinese exports are fuelled by developed-world investment and consumer demand.

Given the above complexities of the workings of capitalism at the world-system level, one must question the supposition that an integrated systems analysis in national "adjusted GDP" indicators is conceivable. Certainly, there has been a good attempt to justify the inclusion of the numerable social and environmental components of ISEW from a

systems view. For instance, the choice of variables in Clarke and Islam's Thai ISEW is based on so-called 'social choice theory'.[85] This enables one to narrow the scope of variables in ISEW that are specifically important for the welfare of the individual (from a social net welfare perspective), e.g. to cover the societal costs of corruption and commercial sex work. 'Social choice theory' embodying the ISEW sounds impressive, and one may, therefore, be tempted to discount Atkinson's (1995:29) and Neumayer's (1999:82-3) 'ad-hoc adjustment' critiques. But, their "social economic and environmental (SEE) system[s] [approach to welfare]" (Clarke and Islam 2006:225, Islam and Clarke 2005:286-7) rooted in social choice theory is severely lost in translation *once* the "adjusted GDP SEE" is constructed. As for Clarke and Islam's (2005a) Thai ISEW study, the "system" is only recognised on a prima facie level. The "systems analysis" is in effect separated once the aggregated indicator has been computed.

Additionally, Clarke and Islam have not embedded enough the connection between the individual and social choice in the underlying capitalist system. They purport to understand "society as a system" and the dilemma between individual and social choices, but how close do they come? They fail to critically evaluate the linkages between the various 'sub-systems' of their *aggregated* measure of "social welfare". Besides, Clarke and Islam (2005a) and Clarke (2006b:172-3), for example, effectively replicate practically all of the other sensible bookkeeping procedures adopted in Daly and Cobb's (1989) ISEW, but make it *appear (misleadingly)* attractive by dividing the various ISEW components into different sub-systems or domains.[86] For instance, their "social sub-system" merely encompasses the following: 'public expenditure on health and education', 'private expenditure on health'; and the problems of 'urbanization' and 'commuting' (evaluated by money) (see Clarke and Islam 2003:7, 2005a:83-5). If (their use of) social choice theory is correct, then the inclusion of the benefits of volunteer and household labour and the costs of crime and family breakdown would render the Genuine Progress Indicator (for instance) useless in this area—since Clarke and Islam exclude these items in *their* version of the "social sub-system".[87] Leaving out these non-market items is at odds with many who argue that the contributions of good motherhood and fatherhood are just as valuable as nature's contributions to the economic productiveness (e.g. Mellor and Langley 2002:54-7). Women, for example, "birth children,

[85] See *Section 3.4* above.

[86] However, Clarke and Islam do improve the methodology and realise the value of a disaggregated account. Thus, my critique primarily applies to the "adjusted-GDP" measure and *not* to their decomposed systems analysis for Thailand (in Clarke and Islam 2004:ch.4).

[87] *N.B.* In the latest version, Clarke and Shaw (2008:273) have incorporated 'household labour' under the umbrella of the "Spiritual Domain" in their Thai GPI. Of course, this does not necessarily solve the problem, since the whole idea of ascribing monetary values to 'unpaid work' is controversial, and, in particular, the ISEW stumbles on this issue (see Waring 2009:170).

teach, and nurture them, ... they grow and protect shade plants that make their communities liveable, and much, much more" (O'Hara 2009:183). Therefore, "partial comparability" has limitations, in particular, when a specific socioeconomic system is unspecified (H2c(i)).

A person is mostly accountable for their 'service' and 'disservice' towards themselves and society. However, as argued by Paul Baran in *The Political Economy of Growth*, "his behaviour is [partly] determined by the social order in which he lies, in which he was brought up, which has molded and determined his character structure, his categories of thought, his hopes and his fears" (Baran 1957:137). In other words, we are all accountable for our individual actions to a certain point, but many of these actions are not entirely freely chosen, but are brought about and constrained by the particular social structures within which we operate. The quandary is that this impersonal, profit-driven market process tends systematically to expropriate wealth from other people and debase the environment (Foster 2004:7-8). On linkage between the individual utility/satisfaction and society, Baran makes the following assessment: analysing "social welfare" outside a specific socioeconomic system is useless (Baran 1957:139). What is needed is an exploration of the conditions that are conducive to service (welfare) along with a study of the degree to which the economic and social institutions and relationships of capitalist society further or impede the welfare of people. Hence, depending on the institutional arrangement, economic growth may or may not provide a good measure of real welfare progress. If the institutions are working progressively to promote 'service', then economic growth is conducive to real net welfare (H2d(i)).

However, the system tends to reproduce waste (i.e. disservices) *and* obstruction of productive service potential, rather than a progressive response to the system-problems. The production of "superfluities and spurious goods" or "useless, wasteful, or positively destructive" output become rife under monopoly capitalism (Baran and Sweezy 1966:ch.5,11).[88] The notion of 'economic scarcity' is not convincing when one considers waste, idleness and the frantic effort to find consumers—as well as dubious design innovations and packaging. Potential abundance affirms itself inadvertently and continual human deprivation and ecological destruction have a two-fold unsettling effect. An "ideological wasteland" subsists in which "work and consumption share the same ambiguity" and "increasingly lose their inner content and meaning" (Baran and Sweezy 1966:346). Ultimately, the system becomes inveterately dysfunctional even on its own terms. The implication of this result is a distorted picture of sustainable economic welfare, especially when the *irrationality of the system* moves into the forefront of critical

[88] However, from the perspective of the 2000s, the capitalist world appears far different than it did when *Monopoly Capital* was written in the early 1960s.

thought. *Monopoly Capital* was a significant literary treatise on the costs *of capitalism*—not simply, as implied by ISEW advocates, the costs of *a vague form of (un)systematised development*. 'Capital', 'service' and 'society' are viewed largely as separate from a specific *socioeconomic system* (H2d(i)). A simple adjustment of GDP would be meaningless, unless a specific socioeconomic system is connected to ISEW theoretical foundation.

With respect to hypothesis H2d(ii), capitalism as a revolutionary socioeconomic system entails rapid change; this was articulated by Karl Polanyi (1886–1964) in *The Great Transformation* (1944). In pre-capitalist formations, social customs and the economy were not seen as separated and potentially conflicting forces. For the vast majority of societies in human history, the 'economy' is mostly unseen. In these societies, economic behaviour was interwoven with the general fabric of social, political, and religious life. Economic activity was motivated by social obligation and regulated by the moral context that governs social life in general. However, according to Polanyi, the idiosyncrasies of the social economy matured in the nineteenth century as markets were extended to all aspects of cultural life.[89] This had the effect of reducing all of social existence to an exclusive ambition, the *desire for gain* (Polanyi 1957:30). "Economic" became the same as "market", and the "economy" changed into a system that can somehow be understood as distinct from the political processes, cultural norms and history. He defines a market economy as a socioeconomic system founded on a self-regulating market organisation, or an economy where all aspects of life are "directed by market prices and nothing but market prices" (Polanyi 1957:43).

He affirms that sustainable social arrangements are irreconcilable with an economy founded solely on a self-regulating market organisation (Polanyi 1957:73-6). This is because the system tends towards instability if left alone, and thereby requires the insertion of new forms of reciprocity, redistribution and informal marketplace changes to create 'system functions'. The dynamics of capitalism can be understood as the production of a "*double movement*". These are protective responses involving the safeguarding of social existence against the imperatives of the spreading market. Polanyi's drift is that certain institutions, contracts, and governance systems, rules, and conventions are needed

[89] Polanyi showed that although the market preceded the nineteenth century, it had a very secondary and incidental role in pre-capitalist formations: "markets were merely an accessory feature of an institutional setting controlled and regulated more than ever by social authority" (Polanyi 1957:46,67). Reciprocity and redistribution were the overriding forms of integration in these societies (Polanyi *et al.* 1971:ch.5). These were societies having the economy embedded in the general framework of social, political, religious and moral life, and because of that, human aspirations in these societies are reckoned to be considerably varied. Thus, an embedded economy signifies that broader social goals and values such as reciprocity in social behaviour or obligations to community and state subordinate the motive of gain (instead of gain being central to the economic process) (Champlin and Knoedler 2004:896).

by market society to provide system-functions or "services" for the continuum of the economic process.[90] Without these system functions, major instabilities and conflicts would impinge upon the system, problems which encroach upon the operation of market society. The dominance of a self-regulating market organisation created "fictitious commodities" for land, labour and money.

Extra awareness is needed in the case of 'fictitious commodities' such as *land*, *labour* and *money* (Polanyi 1957:68-76), by an array of institutions, relationships, agreements, contracts, and rules to adequately regenerate them through successive periods. Firstly, a system of property rights and heritage listings, the protection of vulnerable species, regulation against pollution to enable sustainable development, and rules to prevent global climate change and ozone depletion are needed by *land*. Secondly, institutions of gestation, schooling and socialisation are needed by *labour*, and protection is needed against workplace accidents, underemployment and destruction of skills. In addition, certain accords between capital and labour must exist to reduce uncertainty. And thirdly, adequate institutions are required for *money (and credit)* to produce legal tender, protect the value of the currency, and also provide (inter)national lender of last resort facilities in case of crises and depressions. Completely free markets cannot supply these system-functions, and so there is a need for collective action via governments, communities, local groups and corporate representatives. The vast majority of contradictions of contemporary capitalism work under the canopy of the *disembedded economy*.

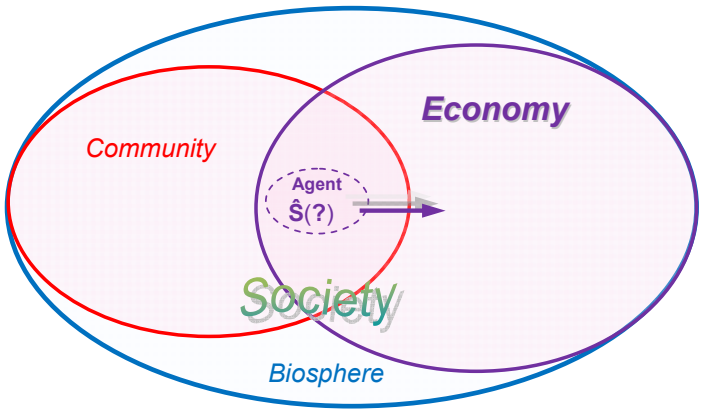
In the disembedded economy, economic relationships tend to dominate other aspects of culture (H2d(ii)). That is, 'society' and the 'economy' are separated so much that the ideology of *disembeddedness* now dominates our understanding of social life—the economy is conceived to be "working without the conscious intervention of human authority" (Polanyi *et al.* 1971:68). Bearing in mind that the base of Polanyi's "substantive view" of the economy implies a methodological perspective according to which the economy cannot be separated from the analysis of the social totality. As 'society' is the starting point for Polanyi, the economy can be understood only as a sphere structurally related to all other spheres such as the 'community' and 'biosphere' (determining and being determined by them) (Polanyi 1992:34).[91] But, because of the pervasiveness of disembeddedness in society, the

[90] Protective responses to the market are needed to provide resources for reproduction of essential relationships and processes. To put it another way, the market imperative toward extending commoditisation generated a protective imperative to safeguard social organisation from the effects of commoditisation (see Stanfield 1986:ch.4).

[91] "The human economy then is embedded and enmeshed in institutions, economic and non-economic. The inclusion of the non-economic is vital. For religion and government may be as important for the structure and functioning of the economy as monetary institutions or the availability of tools an machines themselves that lighten the toil of labour" (Polanyi 1992:34).

community and biosphere are being substituted for the economy—i.e. formal market relations replace non-market relations of reciprocity and redistribution. When these processes emerge, the "services" received by agents are actually misrepresented or distorted, as shown in *Figure 3.4* below:

Figure 3.4. The Distortion of the Service in the Disembedded Economy



In *Figure 3.4*, the arrows indicate that an agent is increasingly reliant on the system for "services" (from fictitious commodities).[92] But as the market forces encroach on life, the community and biosphere shrink relative to the (disembedded) economy.[93] Thus, the critical point in *The Great Transformation* is that the market system tends to destroy the services of existing capitals of taste, tradition, character, nature, community and values in its search for expanding markets which *may* yield ongoing (if doubtful) services, Ŝ(?), of new technological institutions.

It is clear that the ISEW advocates do not want to understand the system from the perspective of the disembedded economy.[94] They are *sui generis*—each theory is unique enough to be qualitatively different but they are too obsessed with the natural environment; yet handle society to a limited degree. In the global disembedded economy, *all* areas of life are both relatively autonomous yet interconnected. The three theories

[92] $\mathcal{U}$ = *Biosphere*. *Society* = *Community* ∪ *Economy*. '*Society*' is a subset of the '*Biosphere*'. The 'Agent' is a representative agent of many (heterogeneous agents or species) who live in '*Society*', and 'Ŝ(?)' is a distorted service to the 'Agent'. n(*Society*) = the number of people living in the capitalist system.

[93] Note that when the system moves towards the community and biosphere, it is typically working out of embedded processes—i.e. a relatively embedded form of capitalism is possible.

[94] There are limitations to the above Venn diagrams. The abstraction into three or four entities underplays the constant change and promotes a static worldview. In the real world, societies, economies and communities exist at different spatial scales (Giddings *et al.* 2002:192). Drawing boundaries between each sphere is haphazard (Dolfsma *et al.* 2005). However, the purpose of *Figures 3.1–3.4* is to illustrate the similarities and differences between the four "pre-analytic visions". Thus, the usefulness lies in the visual comparative analysis of the placement of the primary spheres of economy, ecology and society (as well as the relationship between individual, person, community and markets).

include some major aspects, but have partial, underdeveloped explanations of the benefits/costs generated in the socioeconomic system. In other words, they only have parts of the total theory and have not realised the importance of the whole—much more theory is needed. Therefore, as a point of departure, it is better to have a *political economy theory*, toward a more critical approach to sustainable economic welfare (H2d(iii)). Political economy specialises in comprehending the positive and negative forces of the global and regional environment to achieve a *holistic vision of how the system functions* (see O'Hara 2006c, 2007b).

Marx, Veblen, Keynes and Schumpeter, the four greatest political economists, argue that continuous instability, conflict and disarray are natural to capitalism. In short, their analytical works examine the complex mechanisms responsible for the development (and stagnation) of productive forces. Marx argued that economic development has historically meant a far-reaching transformation of society's economic, social, and political structure. He was deeply concerned with capitalism's tendency for "sapping the original sources of all wealth, the soil and the labourer" (Capital Volume 1 1867:507). Veblen examined the complex mechanisms responsible for the rise and decay of social *and* ecological organisations. He argued that real service creation is problematic especially when "converting all public wealth to private gain" occurs under a system of absentee ownership (Veblen 1923:168). In *The General Theory*, we learn from Keynes (1936:chs.11,12) that instability, uncertainty, and a strong tendency towards stagnation are inherent in the capitalist system. In *Capitalism, Socialism, and Democracy*, Schumpeter (1943:83) argues that the very nature of capital creates a movement for the expansion of markets, the introduction of new methods and products, *and* the constant disruption of established lines of business. Hence, capitalistic processes engender "creative destruction", because business is always looking for economic rents or economic surplus made by degrees of monopoly power, through institutionalising innovation. We discern from the four giants—and the fifth greatest political economist, Polanyi—that critical analysis (and critique) of the system stems from our understanding of the anomalies of capitalism.

A critical principle of political economy is that one must assess the *multiple contradictions of the disembedded economy*. The concept of contradiction states that there are positive and negative features of socioeconomic systems that are *endogenously* ingrained in the fabric of various processes, institutions and relationships. These positive and negative elements are fused together in the structure of the system, and help promote dynamics and change. In other words, a contradiction is defined as something endogenous to the system, that is both central to its positive operational dynamics as well as being a necessary negative outcome (see O'Hara 2006b, 2007a). Central to the principle of

contradiction is the notion of trade-off. Trade-off means that resources are being redistributed from one side of a contradiction to the other: 1) from community to market; 2) from the natural environment to durable fixed business capital; and 3) from society to individual. These trade-offs are seen as *endogenous processes*. In relation to hypothesis H2d(iii), the *political economy of the disembedded system* provides an alternative theoretical approach to the ISEW. The essence of the three theories, 1) community, 2) entropy, and 3) individual–society are inextricably linked to the systematic contradiction of the disembedded economy, as examined below.

Capitalist culture places too much emphasis upon the vagaries of adjusting the pattern of resource allocation, to secure increased efficiency and growth of commodity production. This attempt of GDP growth leads to more neglect of non-commodity needs articulation (e.g. sociality and community), exacerbating the feeling of chronic dissatisfaction.[95] Capitalism requires sustained productivity and demand *even if it destroys community (and society) in the process and creates useless forms of consumption*. There are multitudinous examples of community disembeddedness reducing sustainable economic welfare. The loss of the peace and balance provided freely by the darkness of night because of artificial city lights (Smith 2005). And the loss of local distinctiveness and sense of place: such as (in the UK) churches turned into pubs; family shops and independent cafes bankrupted by large supermarket chains (Kingsnorth 2005, Stones 2006, The Ecologist 2003); and historic breweries turned into luxury flats (Kingsnorth 2006). Finally, belief in change and the compulsion of being up to date or the fear of being out of date ("left behind") become the indispensable essentials of Western culture. This never-ending change makes it difficult for people to maintain a systematic model of the world and their place in it, i.e. to keep shared meanings or traditions to which human emotions are guided. In the process of creative-destruction and destruction-creation, concrete wealth or 'psychic income' symbols such as childhood areas, historic buildings, small businesses, labour skills and wildlife habitats continue to vanish with "progress" (i.e. effective moneymaking).

Linked to the systemic general contradiction is the *entropy* problem, which specifically relates to the business capital for natural environment trade-off. Production—which is based on energy (including solar) and matter flows and transformations—depends not only on labour, but also on non-renewables. In addition to these entropic processes, production is based on ecological systems of amazing complexity. Thus, nature and economy are inseparable. In a production system that regenerates itself by creative-destruction, ecological problems emerge dynamically on a grander scale. The process whereby capital creates buildings, factories

[95] For example, see Stanfield and Carroll (1997:485).

and transportation, and destroys ecological capital to such an extreme degree is associated with the so-called "second contradiction of capitalism" (James O'Connor 1998).

There are two parts to the second contradiction. The first part relates to the antagonistic social relationships between business capital, the state and environmental movements, which may raise the costs of capital and make capital less flexible, and in other ways limit profitability.[96] This becomes a problem when profit, investment-demand and growth are restricted more than any critical mass needed for long-term interests of business and employment. Under these situations, where profit, investment and growth are restricted, it is not likely that market capitalism could increase. However, there are real limits to capitalism (as distinct from barriers). This is the other side of the contradiction. Capitalist production and accumulation—which are dependent on the expansion of investment in manufacturing capital—have destructive effects on the quantity and quality of land, water, air, ecosystems, forests and so forth, which, in turn, limit the range of possibilities open to capitalist accumulation in the future. This results in withdrawals of current and future use values, leading to major problems of maintaining global biodiversity.

In the disembedded economy, the tendency is that the more wide scale business capital is the greater is the exploitation of low-entropy resources. For instance, globalisation has encouraged energy intensive products such as automobiles, electrical appliances, computers and paper (see Li 2008:32). Increases in the volume of trade generates greenhouse-gases. This especially applies to global shipping (Garman 2007:23-4), air cargo and the global expansion of industrial agriculture. The burning of fossil fuels primarily drives this accumulation of greenhouse gases; to serve the ever-growing energy needs associated with durable fixed business capital expansion. In this scenario, we experience higher rates of pollution when more people transform commodities into waste; and when the populace transforms more raw materials per person into commodities, we incur higher rates of depletion of low entropy. Current environmental policies and institutions are not keeping pace with the *global* spread of capitalism. International cooperation on adaptation has been characterised by chronic under-financing, weak coordination and a failure to look beyond project-based responses (see UNDP 2007:167). The nature of the contradiction between business capital and the environment is thus highly disembedded.

[96] This could involve technologically-led restructuring (such as resource planning and toxic waste disposal planning, engaging in mass recycling and so on) to deal with ecological problems, which may or may not be in capital's interest. However, capital has the ability to restructure itself in light of 'natural scarcities', and also to conserve resources and to prevent or clean up pollution (ineffective as these measures are) (O'Connor 1998:124).

Possibly at the root of community and ecological destruction is the unnerving nexus between *agency and structure* (Davis 2003). That is, the contradiction between individual and society. In any system, but particularly in a commodity-driven system, it is important for agents to involve themselves at least in social issues, relating to the local community, household or family and workplace. Some trust, friendship, and sociality are necessary not only to promote one's character but also to provide services for society or 'system functions' of knowledge, communication and trust. Still, the individual motives elevate the interests of specific people and their particular microeconomic affairs—fulfilment of private wants could involve such things as having a diversity of food and owning a home, and sufficient time for achieving personal aims, enjoyment and worship. However, too much individualism leads to societal breakdown, and thus, greater degrees of transaction costs, crime, stress, anomie and alienation (O'Hara 2004). Too much social (particularly familial or state) bonding may repress the individual, reduce social intercourse ('anti-social capital') and restrain their creative self-direction. Hence, both social and individual relations need some balance.

However, there is an increasing tendency toward individuation, independence and individual 'rights' in an increasingly disembedded economy. For instance in the West during the 1950s and 1960s, the family was a more organic type where women mostly engendered familial capital for everybody. But the style and constitution of the family has changed significantly in the 1970s–2000s to a type where the ego is dominant and families are expected to contribute services for individuals who desire to achieve in the broader world. Kirby (2006) argues that a homogenising change of social relationships is experienced across national and cultural divides. Much of this change is associated with considerable shifts in material demand. But also, there are the more subtle material impacts of changes in human support systems providing security, nurture and care. Market spread is eroding the family because most families require two wages to pay for debt (usually for mortgage and credit card purchases), eating out frequently, and are preoccupied with conspicuous consumption. Time is no longer available for the caring, support, nurturing, networking and communicative services necessary to sustain families and communities as the time demands of individual and technological services grow.

The logic of the market is always tending toward "ideals of emulation and status" (à la Veblen 1910:185), and the reason is that the market, as a social institution, upholds the ethics of self-interest at the expense of competing ethical values. Interestingly, Adam Smith argued that self-interested actions, balanced by the workings of competition, helped to create economic order—e.g. "it is not from the benevolence of the butcher, the brewer, or the baker, that we expect our dinner, but from

their regard to their own interest" (Smith 1776:13,22,26-7,456). The key to Smith's belief that the economic self-interested actions of individuals will lead to the public's benefit is encapsulated in the notion of "the invisible hand". However, Smith's framework also requires sufficient self-control on the part of individuals. In *The Theory of Moral Sentiments* (1759), Smith already lays the groundwork for subsequent institutional and ethical critiques of the market—the self-interest–driven agent we find in *The Wealth of Nations* (1776) had to be placed in the context of social institutions that socialise the individual to take into consideration how their actions will affect others. In short, Smith argues that the market must be constrained by an ethical framework of compassion, and it is only when working within such a framework that the market will render efficient and desirable outcomes (see Smith 1759:7, 1776:61-2).[97] This offers an interesting conception for context specific dimensions of expressing personal, social, ecological and global responsibilities. But markets do not generate the self-controlling individuals necessary for markets to work efficiently, thus requiring more and more interventions and regulations into market outcomes (Clark 2006:273).

'The invisible hand' therefore not only encourages fresh baked bread early in the morning, but ecological and social costs as well, if left uninhibited. As Polanyi (1944) reminds us, the reality is that there has always been a continuous need to engender environmental, social and even economic political reactions and controls (e.g. protection laws), which hold back the entrepreneurs' chrematistic self-interest. Hence, for Polanyi, disembedded means divorced from the social controls of religion, the state, traditions, and customs. The individual is free to pursue gain and self-interest, and to get ahead. A core principle that guides their existence is to insatiably improve and realise insatiable potential. Beth and Doug Brown (2005) argue that when we are trapped in the economic race we live like "bogans", i.e. not having a lot of time for being aware and responsible. People become bogans to the extent that people in a market economy are forced to focus on themselves and their performance:

> Driven by our condition of insecurity, competing as individuals, we generally have to accept the reality of the market even though people have also fought for protective legislation that has led to the welfare state and social democracy. ... With everyone on his or her own to either get ahead or be left behind, boganism is the logical result. How so? The individualized competitive race promotes a

[97] Actually, for Smith, Christian morality formed the backdrop for market behavior. However, Clark (2006:269-74) argues that "the main weakness of Smith's system of ethics is that he assumed that economic actors would enter the market place socialized by Christian ethics, yet the market generates a contrary system of ethics".

> narrowing of consciousness and channeling of attention on one's individual situation. This narrowing of consciousness, like blinders, occludes our social vision and perspective. [Brown and Brown 2005:634-5]

The crux of the issue is that: the *structure of the system* of insecurity and competition *induces the agent* into being "ambitious, self-motivated, high achievers—the *Be All You Can Be* self-actualizers" (Brown and Brown 2005:635).

In essence, the problem with disembedded capitalism is that it creates a *society* in which people are increasingly dependent on markets to meet basic needs—the market economy is one that pits each *individual* and business against one another in a competitive struggle. Connected to the dogma of an autonomous market is the destruction of ecological capital and community abandonment. This is why the *political economy of the disembedded system* thesis encompasses the root of the problem: there are *multiple* contradictions that are seen as *endogenous to the system*. The essence of the three ISEW theories, 1) community, 2) entropy, and 3) individual–society is inextricably linked to the systematic contradiction of the disembedded economy. But specifically in relation to sub-hypothesis H2d, the *theoretical particulars of the ISEW abstract from the workings of the capitalist system*, because the ISEW advocates have not specified a *society in the socioeconomic system that we currently have*. This is the critical factor in political economy.

3.6 Conclusion

On a positive note, we have seen that there are several substantive theories to support ISEW. It is argued that three underlying theories of community, psychic income, and welfare economics cement theoretical foundations for ISEW. Contrary to the wisdom of critics, ISEW has certain theoretical foundations (H2). The focal point of the three theories is to evaluate the positives and negatives of economic growth, with the hope of achieving a practical measure of sustainable economic welfare, as summarised below:

Firstly, ISEW is conceptually rooted in *economics for community*. Daly and Cobb (1989) want to connect the growth of the economy and the physical limits of the biosphere in a welfare indicator. The ISEW attempts to describe reality by agreeing with the *principle of internalization*: internalising localised 'spillover effects' and "pervasive externalities" that negatively affect social welfare. With this underlying principle available, a measure of sustainable consumption can be derived from an extended notion of Hicksian income. This notion of income is, in principle, based on *strong sustainability*, i.e. that there are no substitution possibilities between the durable stocks of capital. This means that the success of

policies designed to increase the aggregate of consumer durables to individuals must not destroy or weaken the existing patterns of social relationships. Hence, the heart of ISEW is an economic order that supports the pattern of personal relationships that make up the community. Theoretically, ISEW is embedded in *oikonomia*, the management of the household to increase value (*service*) to all members over the *long-run*. The oikonomia model *expresses social community and biophysical interdependence*. It is argued that the heart of ISEW is to determine whether the economy is supporting or destroying a healthy community in a *sustainable* manner.

Secondly, the ISEW is conceptually based on *entropic net psychic income*. In *The Nature of Capital and Income*, Fisher (1906) theorised that a proper accounting of 'income' must reflect only the flow of services of 'wealth' (or 'capital') enjoyed by people, during an appropriate time period. Hence, service (or 'income') is considered the essence of *welfare*, not necessarily the wealth itself. However, the flow of services need not be positive. There can be disservices, also known as negative income or "outgo". In essence, 'net psychic income' is the total satisfactions received from the use value of goods minus the undesirable or unwanted side effects from the production process. This major component provides the theoretical underpinning of ISEW. 'Sustainability' is also a critical aspect of the ISEW, which Philip Lawn has well set out in his writings. The stock of human-made capital (producer goods such as plant, machinery, and equipment) depreciates and wears out through use. But the production to replace worn out human-made capital is a *cost*, as there is an ongoing throughput of matter-energy (the input of low entropy resources and the output of high entropy wastes). That is, the depletion of the finite stock of ecological capital is an *entropic process*. The important point is that less production and less consumption over time leads to a lower rate of depletion of the ecological capital stock (resource assets, ecosystem services etc.). The summation of the positive and negative flows of income minus the lost services of ecological capital is the *entropic net psychic income*.

Thirdly, utilising some principles of welfare economics, the ISEW is theoretically based on a *social welfare function*. A workable social welfare function (ISEW) can be constructed by fusing together the concepts of (a) social choice, (b) partial comparability, and (c) cost-benefit analysis. The social welfare function embodies relating social preference (or decisions) to the set of individual preferences. This is because the preferences or utility of agents do not internalise the costs or externalities of economic choices. That is, an individual's choice is at odds with the welfare optimising *social choice*. "Social choice" is about relating social judgements to the views and interests of the individuals who make up the society. By emphasising the possibility of constructive social choice

theory, as Amartya Sen skilfully argues, the use of interpersonal comparisons allows public decisions to be sensitive to inequalities in well-being and opportunities. This demands *partial comparability*, which will be effective for making social decisions or generating an 'optimal' social choice. This means accounting for the *salient* negative externalities in ISEW, which can be calculated by *compensatory* or *defensive expenditures*. A cost-benefit analysis *with* social choice theory is appropriate for welfare planning, because it incorporates various social concerns about welfare that are not adequately captured by individuals within the market place. This is the original contribution for ISEW by Matthew Clarke and Sardar Islam. Hence, the social welfare function involves the maximisation of net benefit of economic growth (the benefits from the utility provided by goods and services) minus the costs of the damages caused by growth.

However, there are major limitations in the approach to sustainable development as construed by the advocates of ISEW. They have a tendency to view 'society', 'capital' and 'service' as largely autonomous of any specific *socioeconomic system*. The three theories include some major aspects, but have partial, underdeveloped explanations of the benefits/costs generated in the socioeconomic system. This is the crux of the problem for ISEW. It is argued that the ISEW advocates fail to understand the system—from the perspective of the *political economy of the disembedded system*. A critical approach to sustainable economic welfare entails an exploration of the system conditions conducive to service and disservice, i.e. the disembedded economy is beset with *multiple contradictions*. This links to various problems in all areas of the social economy. A holistic vision of the positives and negatives endogenously generated *is* needed. It is argued that the political economy of the disembedded system provides the holistic foundation.

It is not the purpose of this chapter to provide a comprehensive critique of ISEW. Yes, this study raises fundamental questions about the ISEW approaches, demonstrating that they themselves fall into a kind of fallacy of misplaced abstractions, in failing to incorporate an understanding of the historical socioeconomic system of capitalism, as the fundamental background condition. But many questions remain unanswered. How could acknowledging capitalism's particular characteristics constitute a real questioning of the ISEW *per se*? To begin with, we have not evaluated the inherent limitations of measuring welfare with 'income', nor have we provided an exact solution to the problem of sustainable economic welfare indicator construction. Without undertaking a thorough empirical and technical scrutiny of the ISEWs and other related indicators (in the existing literature), it is difficult to ascertain the complete inadequacy of socioeconomic foundations in the index's construction. Nonetheless, the underlying problems of ISEW

should become manifest in the critical empirical investigations from the perspective of political economy.

Is it possible to bring ISEW and the political economy critique (concerned with the entire socioeconomic system) discourses more closely together? How might the obvious failure of ISEW schools to confront the socioeconomic system be addressed? After all, Daly and Cobb embrace within their larger work (extending beyond their ISEW analysis) some aspects of the political economy critique. For instance, embracing the oikonomia solution within the context of the political economy of a disembedded system might be useful and help to 'prepare the ground' for more detailed analyses. As a minimum, there needs to be a critical examination of the dialectic of service and disservice. Separating those services in the ISEW that improve community well-being from those that are 'commoditised' would be necessary (and an empirical challenge). Modifications to the ISEW components of personal and public consumption expenditures vis-à-vis the degree of disembeddedness over real historical time are vital. It would be useful to examine Polanyi's 'double movement' when treating defensive responses (à la 'defensive expenditures'). It also might be a question of showing that these characteristics (unfavourable to sustainability) tend to increase pollution and/or increase the cost of defending against pollution, showing in particular an increased divergence between GDP and ISEW.

Regrettably, a notable problem is that the advocates of ISEWs have not really developed the oikonomia model. Daly and Cobb's (1989) notion of an "economics for community" apparently disappears in the construction of their ISEW (and the studies undertaken in the last twenty years). At the time, the authors of *For the Common Good* did not feel competent to develop a new multi-dimensional empirical measure of welfare congruent with the person-in-community vision. Daly and Cobb (2007:288) agree that, against their wishes, more attention has been paid to ISEW (in the appendix) that has probably deflected attention from the more basic person-in-community argument.

Therefore, even if the oikonomia approach provides the grounds for discrediting the interpretation of GDP as an indicator of welfare, it does not necessarily imply the need for one alternative, monetary indicator. As Simon Kuznets (1947:29) said half a century ago, "[o]ne source of doubt is ... that these over-all quantities, no matter how well defined and closely articulated, must ... gauge ... a wide variety of forces[, which] ... is extremely difficult". In other words, he argued that total national income should be measured in as many ways as possible. It is likely that an alternative set of non-monetary, multi-indicators measuring the political economy of the disembedded system is the next step forward.

Is the ISEW project simply mistaken or is there some way of transforming it within the context of a political economy critique? There

are two paths that we may take, either abandoning the ISEW approach or finding a way to integrate it with the political economy critique. Some critical questions for further research might need to be addressed. How is the ISEW congruent with Marx (capital accumulation), Veblen (absentee ownership), Keynes (effective demand), Schumpeter (creative destruction), Baran and Sweezy (the penetration of the sales effort into the production process), Martin O'Connor (the contradictions of "natural capital"), James O'Connor ("the second contradiction"), Burkett/Foster (metabolic rift), and Polanyi (double movement)? The extent to which we can incorporate the challenges posed by the political economy theory is the critical factor determining the abandonment or redevelopment of ISEW. The result will become evident as the critical appraisal continues in the next few chapters. We need to break away from the conceptual critique and into the empirical and technical scrutiny of ISEW *et al.* analyses. Chapters four and five provide a comprehensive survey of the net income indices in relation to empirics, methods, criticisms, and technicalities.

Chapter 4.
A Comprehensive Survey of Net Income Indices – Empirics, Methods and Criticisms

4.1 Introduction – Overview of the Net Income Indices

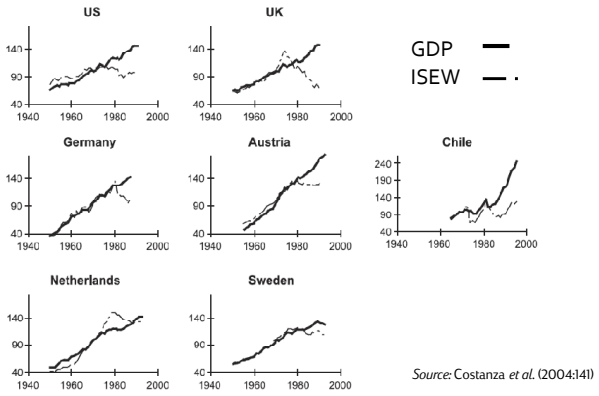
In the previous chapter, we showed that there are three major theories to support the Index of Sustainable Economic Welfare (ISEW): economics for community, entropic net psychic income, and a social welfare function. However, the critical analysis also demonstrated that there are major limitations in this approach to sustainable development as construed by ISEW advocates. Conceptually, that is, they failed to incorporate an understanding of the historical socioeconomic system of capitalism, as the fundamental background condition. Some imperative questions arise. How will this underlying problem of ISEW manifest in their (the authors') empirical analyses and the technical particulars of the index's construction? Which studies attempt to incorporate a specific theory? How are the trends between ISEW and GDP analysed in relation to the system? What variables are excluded and included in the authors' measures? Chapters four and five search for meaningful answers to the underlying assumptions behind the empirics and techniques of the net income studies, with the aim of determining whether these are superior measures of 'sustainable economic welfare'.

It is often postulated that *Sustainable Economic Welfare Indicators* (SEWIs) are good measures of social and environmental welfare: for instance, they provide convincing evidence for the "threshold hypothesis"—that economic growth improves quality of life up to a point, but eventually erodes environmental and social quality, reducing quality of life (Max-Neef 1995:117). One of the leading advocates argues that:

> Irrespective of whether the ISEW, GPI, or SNBI has been calculated for a particular country, the trend movement in the chosen index consistently reveals that, up to a point, the growth of macroeconomic systems is beneficial to human well-being. Beyond this point, growth appears to be detrimental. Although ecological economists openly admit that the ISEW, GPI, and SNBI are not without their imperfections, they nonetheless believe that these indexes *offer solid support for the threshold hypothesis* and the need for countries to abandon the growth objective in favour of sufficiency, equity, and natural capital maintenance. [Lawn 2005:186]

What Lawn and other authors typically do is compare the trends of their adjusted-GDP per capita measure with GDP per capita over real historical time. For example, all seven national ISEW studies in *Figure 4.1* below illustrate that the growth in economic activity since about the mid-1970s has been producing not an improvement in welfare, but a general levelling off or even a reduction in aggregate net welfare:

Figure 4.1. Trends in real GDP and ISEW (per Capita) for Various Countries (1970=100)



Source: Costanza *et al.* (2004:141)

The relationship between GDP and ISEW over the last 30–50 years of the twentieth century seems to reveal that, up to a point, the growth of macroeconomic systems was favourable to human well-being.

However, this consensus view amongst SEWI advocates is not without controversy. Moreover, we have to be cautious about accepting the empirical claims made by the SEWI supporters at face value, given the problematic of the three theories (Brennan 2008). That is, there is more evidence to investigate before we can ascertain the complete inadequacy of ISEWs and other related indicators—some important matters were consciously not studied. A critical review of the literature is thus necessary and significant, as to our knowledge no such document exists. Because the scale of the inquiry is enormous, the literature review is divided into two chapters.

Directing the primary literature survey, the following hypothesis three (H3) will be assessed:

H3: Net Income Indices are good measures of environmental and social welfare.

There are six variants of the net income indices: the Measure of Economic Welfare (MEW), Economic Aspects of Welfare (EAW), Index of Sustainable Economic Welfare (ISEW), Genuine Progress Indicator (GPI), the Sustainable Net Benefits Index (SNBI) and Fisherian Income (YF). Subject to existing data availability, each analyst has obtained

estimates of the variables required to compute their indicator for the nation/place of interest, utilising multiple sources such as government reports and the System of National Accounts. Commencing in 1972 and ending in April 2009, there have been forty-five individual studies involving construction of a net income indicator. The empirical (and technical) aspects of these measures are worthy of a more detailed appraisal because it is generally accepted that the net income indices are necessary and adequate measures of sustainable socioeconomic welfare (H3).

Chapter 4 provides a comprehensive survey of the net income indices from the perspective of political economy. Our approach in this chapter—which is a broad one—is obviously limited to providing a very detailed technical analysis. Hence, for a realistic appraisal we have elected to split the literature survey into two chapters. We will touch on the technical accomplishments in this current chapter but the mechanics of the SEWIs are critically evaluated in chapter five. This ensures an adequate reflection and appreciation of the complexity, diversity and technical scope of the net income studies.

The heart of the literature review is critically evaluating the net income indicators in relation to empirics, methods and (our) criticisms. In general, each study is chronologically assessed, which typically entails the following evaluation method: a) an introduction to the study; b) any advances in theory or techniques (methods) accomplished; c) a presentation and commentary of the empirical results; d) a discussion of the most important conclusions; and e) identifying ongoing/potential problems. More specifically, the following broad areas will guide our analysis: original contribution; theory; techniques; and historical application. However, even if it not possible to address all of these areas consistently, we are predominantly interested in the degree to which the advocates provide specificity—viz.: *1)* the conceptual groundwork; and *2)* socio-historical institutional analysis. We scrutinise whether the authors follow or develop Daly and Cobb's oikonomia model, apply social choice theory, or integrate an adaptation of entropic net psychic income. Additionally, we dissect the authors' trends concerning the indicators (where possible), focusing on the calibre of historical specificity vis-à-vis business cycles and institutional dynamics. Where appropriate, we offer constructive comments and/or criticisms in relation to the above areas.

This is a meaty chapter; following the introduction, it is divided into twelve major sections. *Sections 4.2 to 4.11* are the backbone of the literature survey, and the entire collection of net income studies up to and including April 2009, including the various criticisms, suggestions and responses by advocates is summarised in *Table 4.1* below:

Table 4.1 An Overview of the Contributions of Net Income Indices

CHAPTER OUTLINE: Author(s)/Category	Nature of the Inquiry: Place and Period of Study
4.1. Introduction	
4.2. Measure of Economic Welfare (MEW)	
Nordhaus and Tobin (1972)	US MEW, 1929–1965
4.3. Economic Aspects of Welfare (EAW)	
Zolotas (1981)	US EAW, 1950–1977
4.4. Index of Sustainable Economic Welfare (ISEW)	
Cobb (1989) in Daly and Cobb (1989)	US ISEW, 1950–1986
Cobb and Cobb (1994)	US ISEW, 1950–1990
Diefenbacher (1994)	German ISEW, 1950–1987
Jackson and Marks (1994)	UK ISEW, 1950–1990
Jackson *et al.* (1997)	UK ISEW, 1950–1996
Moffatt and Wilson (1994)	Scottish ISEW, 1980–1991
Rosenberg *et al.* (1995)	Dutch ISEW, 1950–1992
Jackson and Stymne (1996)	Swedish ISEW, 1950–1992
Stockhammer *et al.* (1997)	Austrian ISEW, 1955–1992
Guenno and Tiezzi (1998)	Italian ISEW, 1960–1990
Castañeda (1999)	Chilean ISEW, 1965–1995
Gil and Sleszynski (2003), Prochowicz and Sleszynski (2006)	Polish ISEW, 1980–1997; Polish ISEW, 1990–2003
Clarke and Islam (2004, 2005a), Clarke (2006b)	Thai ISEW, 1975–1999
Bleys (2007a, 2007b)	Dutch ISEW, 1971–2004
4.5. Genuine Progress Indicator (GPI)	
Cobb *et al.* (1995)	US GPI, 1950–1994
Anielski and Rowe (1999)	US GPI, 1950–1997
Cobb *et al.* (1999)	US GPI, 1998
Cobb *et al.* (2000); Cobb *et al.* (2001)	US GPIs, 1999; 2000
Venetoulis and Cobb (2004)	US GPI, 1950–2002
Talberth and Bohara (2006), Talberth *et al.* (2007)	US GPI, 1950–2004
Hamilton (1997, 1999)	Australian GPI, 1950–1995
Hamilton and Denniss (2001)	Australian GPI, 1950–2000
Lawn and Clarke (2006b), Clarke and Lawn (2007)	Australian GPI, 1986–2003
*Authors in *Sustainable Welfare in the Asia-Pacific* edited by Lawn and Clarke (2008d)	Seven case studies of the GPI in the Asia-Pacific region: Australia, China, India, Japan, New Zealand, Thailand, and Vietnam
4.6. Subnational GPIs and ISEWs	
Anielski (2001)	Albertan (Canada) GPI, 1961–1999
Costanza *et al.* (2004)	Vermont, Chittenden County and Burlington (US) GPIs, 1950–1998
Clarke and Lawn (2005), Lawn and Clarke (2006a, 2006b)	Victorian (Australia) GPI, 1986–2003
Pulselli *et al.* (2006)	Sienan (Italy) ISEW, 1999
Jackson *et al.* (2006)	UK Regional ISEWs of Yorkshire and Humber, and the Northern Way, and the national ISEW, 1994–2004
Bleys (2006a, 2006b), Bleys (2008)	Belgian ISEW, 1971–1999; Belgian ISEW, 1970–2004
Wen *et al.* (2007)	Suzhou and Yangzhou in Jiangsu province, Ningbo in Zhejiang province, and Guangzhou in Guangdong province (China) GPIs, 1991–2001
*Bagstad and Ceroni (2007)	Six Northern Forest counties in Vermont (Caledonia, Essex, Franklin, Lamoille, Orleans and Washington) GPIs, 1950–2000
4.7. Sustainable Net Benefits Index (SNBI)	
Lawn and Sanders (1999), Lawn (2001)	Australian SNBI, 1966-67 to 1994-95
4.8. Fisherian Income (YF)	
Lawn (2004b, 2006c)	Australian YF, 1967–1997
4.9. Criticisms and Suggestions in the Existing Literature	
Authors in *The Green National Product* (1994)	Various complications of the ISEW
Atkinson (1995) and Crafts (2002) Neumayer (1999, 2004), Dietz and Neumayer (2007) Neumayer (2000), Dietz and Neumayer (2006b) Neri and Bradstreet (2006)	Measurement-technique problems and a critique of the conceptual foundation of the ISEW/GPI/SNBI
Böhringer and Jochem (2007)	Critique of the mathematical foundation of ISEW/GPI
Ziegler (2006, 2007), Daly and Cobb (2007)	Critique of the conceptual-empirical foundation of the ISEWs
**Brennan (2008)	Survey and critique of the net income indicators
Nourry (2008)	French ISEW and GPI, 1990–2002
4.10. Responses by Advocates and Some of the Persistent Problems	
Lawn (2003, 2005, 2006a, 2006b, 2007b), Clarke and Lawn (2006), Forgie (2007), Clarke (2007), Niccolucci *et al.* (2007)	Resolving some of the theoretical and method-technique problems of the ISEW, GPI, SNBI and YF
Harris (2007, 2008), and Lawn (2008d)	A debate between a new critic and the leading advocate
4.11. Deficiency of a Strong Socio-Historical Institutional Analysis and Lack of Advance in Theory	
4.12. A Summary of the Results from the Degree of Literary Contribution Scale (DLCS)	
4.13. Conclusion	

* These papers/articles could not be obtained in a timely fashion before the completion of this manuscript (due to the high cost and the difficulty of sourcing local supplies), and thus were not subjected to a critical analysis in the literature review (*Chapters 4 and 5*). Nonetheless, I have read these works and have provided comments/criticism where appropriate in the text.
** The critique by Brennan (2008) has already been discussed in *Chapter 3*.

The above table provides an almost complete reference library of the MEW, EAW, ISEWs, GPIs, SNBI and YF studies—vis-à-vis empirics, methods and criticisms.[98] *Sections 4.2 and 4.3* examine the MEW and EAW respectively. These sections are important preliminaries for understanding the evolution of the ISEW and related indicators, and serve as a good introduction to the literature on net income indicators. In *Sections 4.4 and 4.5*, we examine the various ISEW and GPI studies worked out at the national level, while *Section 4.6* examines the studies done at the subnational level. At the end of these sections, summaries of the strengths/weaknesses of the national ISEWs, national GPIs, and the subnational studies (ISEWs, GPIs) are given. This will aid the reader in handling the large flow of information. *Section 4.7* looks at the SNBI, and *Section 4.8* inspects the Fisherian income studies. *Section 4.9* succinctly reviews the criticisms and suggestions of the net income indicators, and *Section 4.10* looks at the various responses by advocates and by a new critic. The main conclusion in this study is that there are tendencies in the SEWI literature for authors *not* to substantially theorise about their measures *nor* have a strong socio-historical institutional analysis. How serious a problem is this? *Section 4.11* demonstrates with applied empirical investigations of the SEWIs that these are indeed major problems.

Section 4.12 delivers an overall assessment of the net income studies in relation to α) advances in theory, and β) strength of the socio-historical institutional analysis. In order to evaluate H3, i.e. whether or not net income indices are good measures of environmental and social welfare, we will rate the authors' levels of contribution with a score out of ten. With reference to criteria, α and β, the degree of literary contribution scale (DLCS) is thus devised. A rating is based on the investigator's value judgements that relate to a *thorough inspection of the empirical literature on SEWIs*. *Section 4.13* then summarises the chapter. It is argued that the net income indices are not very good measures of environmental and social welfare (H3): many authors provide no major good or detailed advancement in theory and no one provides a *strong* socio-historical institutional analysis. Concisely, no author in the literature has undertaken a meticulous study of each work for the sustainable economic welfare indicators. It is the purpose of this chapter to embark on a systematic, detailed and scholarly examination of the conclusions drawn in the literature, beginning with the MEW in *Section 4.2* below:

[98] We have delimited the scope of the literature survey to articles (in English) on SEWIs (MEW, EAW, ISEW, GPI, SNBI, and YF only) published between 1971 and April 2009. There may be a few works published that I am not aware of.

4.2 Measure of Economic Welfare (MEW) for the US

Nordhaus, William D. and James Tobin (1972) "Is Growth Obsolete?", in Milton Moss (Ed.), *The Measurement of Economic and Social Performance. Conference Research Studies in Income and Wealth*, New York: Columbia University Press, pp. 509-532.

Nordhaus, William D. (1977) "Economic Growth and Climate: The Case of Carbon Dioxide", *The American Economic Review* (May).

One of the first efforts in the literature to develop a convincing measure of the role of the economy in generating welfare was that of Nordhaus and Tobin (1972). They wanted to reveal over the 1929–1965 period the relationship between GNP and economic welfare in the United States; albeit due to lack of data only seven discrete data points could be used (1929, 1935, 1945, 1947, 1958, and 1965). The instrument they utilised was the Measure of Economic Welfare (MEW). The MEW involved "reclassification of GNP expenditures as consumption, investment, and intermediate; imputation for the services of consumer capital, for leisure, and for the product of household work; and correction for some of the disamenities of urbanization" (Nordhaus and Tobin 1972:5).

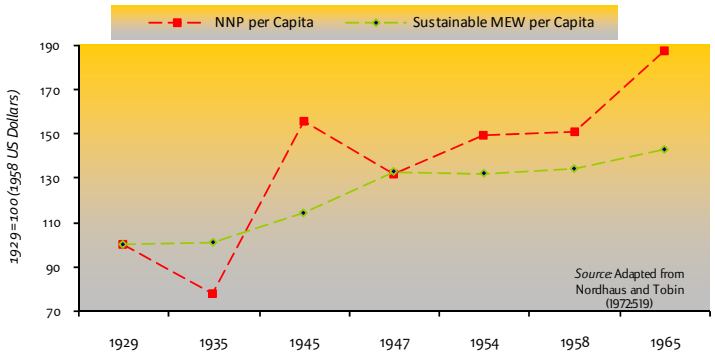
While the MEW has no apparent theoretical basis, Nordhaus and Tobin began with GNP (or private consumption) and made several adjustments as follows. The authors separated final consumer expenditures from intermediate (non-final) expenditures, since they argue economic welfare is a matter of per capita 'consumption'. After a depreciation allowance of durable fixed business capital from GNP (i.e. the Net National Product, NNP), they examined the following positive imputations: services flowing from the stocks of consumer durables, government and business capital, as well as leisure (nonmarket work). Next, they reclassify education and health expenditures as 'investments', and deduct expenditures that are "regrettable necessities" rather than contributions to welfare.[99] To the regrettable necessities category, they consign the costs of police services, sanitation services, commuting to work, road maintenance, and national defence. There is some disagreement over these items. For example, it may be argued that police protection and defence expenditures contribute to welfare. But on the contrary, this argument may be disputed; i.e. the increasing costs of police protection and defence budget allocation does not imply that people are less vulnerable to crime or to wars/terrorism than we were in the past. Lastly, on a less controversial issue, the authors sought to account for negative externalities. That is, the urban disamenities connected with economic growth, e.g. some portion of the higher earnings of urban residents may be simply compensation for living in a more demanding urban environment.

Their non-continuous results of the real growth rates for US NNP per capita and the MEW per capita over the following years, 1929, 1935,

[99] Since some portion of the NNP must be reinvested for a rising population, in order to obtain a measure of 'sustainable' per capita consumption, the authors subtract from the NNP the regrettable necessities.

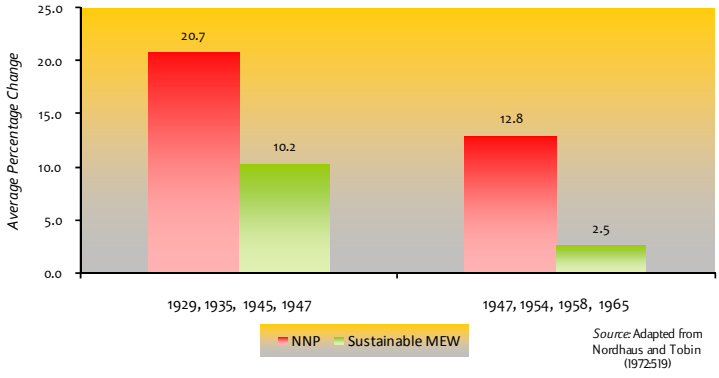
1945, 1947, 1958 and 1965, are illustrated utilising both a figure and a table. In a comparative analysis of time-series data, a non-monetary indexation of 100 is useful because it illustrates the relative growth trends between the indicators over the period of examination. A higher index value means at the end of a period there was, on average, more growth experienced by that variable. In most of our empirical analyses of the net income indices, we will be utilising this format of normalisation, where the base year is set to 100. Giles Atkinson (1995:4) says that "the [absolute] magnitude of a MEW relative to, say, GNP is only partly the object of interest. The performance of any new indicator over time is a more relevant question". For instance, over the unstable period (1929, 1935, 1945, 1947) the US NNP per capita fluctuated, but the MEW per capita grew steadily, as shown in *Figure 4.2* below:

Figure 4.2. US NNP and MEW, 1929 to 1965 (Discrete Period)



Adding specificity to the growth trend analysis, *Table 4.2* below shows the noteworthy differences between the NNP and MEW per capita average real growth rates over two relatively distinct historical periods:

Table 4.2. US NNP and MEW (per Capita Real Growth Rates), 1929 to 1965



Over the 1929 to 1947 period, per capita NNP grew by almost 21% (possibly due to war production) relative to 10% of the per capita MEW.

During the post-war period (1947–1965), NNP and MEW grew respectively at 13% and 2.5%. Thus, it is evident that there are large gaps (in the growth rates) between NNP and MEW over their respective periods, 1929, 1935, 1945, 1947 *cf.* 1947, 1954, 1958, 1965. However, according to their MEW results in the table above, the depressing/war-torn period was much more welfare enhancing (four times greater) than the post-war period. This peculiar result suggests that the exercise to create a new measure of net welfare is potentially flawed.

Besides, there is some ambiguity with *their* analysis between NNP and MEW, because they ignore changes in economic activity during the war and post-war experience. They are simply interested in the 1929 to 1965 period as a whole. Moreover, one of the goals of Nordhaus and Tobin in the construction of the MEW was to demonstrate that GNP similarly correlates with economic welfare *and to make it redundant to use the instrument they formulate*. "Although the numbers presented here are very tentative, ... [t]he progress indicated by conventional accounts is not just a myth that evaporates when a welfare-orientated measure is substituted" (Nordhaus and Tobin 1972:17). After reflecting on the significance of the work by Nordhaus and Tobin (1972) five years later, the interpretation of the results and conclusions drawn by the authors are unchanged (see Nordhaus 1977:197). The authors see little value in constructing any other type of net welfare indicator—a claim that might have greater validity if they had adapted a stronger socio-historical analysis of the institutional dynamics of the GNP and MEW.

As first noted by Daly and Cobb (1989) in their literature review of MEW, a conceptual problem with Nordhaus and Tobin's net welfare measure is that they are unaware of 'defensive expenditures'. Defensive means a *defence against the unwanted side effects of production*. This is not to say that, for example, food expenditures are a defence against hunger or clothing and housing expenditures defend against cold and rain. In other words, the ordinary baseline environmental conditions of cold and rain (and so forth) are not regrettable necessities because defensive expenditures are only those that were regrettably made necessary by other acts of production. Defensive expenditures need to be counted as costs of that other production; i.e. counted as intermediate rather than final goods. The validity of their GNP adjustments is at stake because of their problematic conceptualisation of the list of "regrettable necessities".

Nonetheless, the authors of MEW recognise that:

> the line between final and instrumental outlays is very hard to draw. For example, the philosophical problems raised by the malleability of consumer wants are too deep to be resolved in economic accounting. Consumers are

> susceptible to efforts of producers. Maybe all our wants are just regrettable necessities; maybe productive activity does no better than to satisfy the wants which it generates; maybe our net welfare product is tautologically zero. [Nordhaus and Tobin 1972:5]

While the authors have overlooked 'defensive expenditures' they make a fascinating point about the inherent limitations of relying upon the systems of nationals accounts to radically construct a better measure of social and environmental welfare. It will be interesting to see what other studies have to say about this. Is it questionable to conclude "our net welfare product is tautologically zero"? Unfortunately, there is no detailed treatment of this issue by the authors of MEW; it is only mentioned in passing, so a proper answer cannot be ascertained at this stage. In retrospection, the various flaws in their analysis are somewhat pardonable because it was an important opener into the debate of net welfare indices and economic growth.

4.3 Economic Aspects of Welfare (EAW) for the US

Zolotas, Xenophon (1981) *Economic Growth and Declining Social Welfare*, New York: New York University Press.

Xenophon Zolotas (1981) in *Economic Growth and Declining Social Welfare* went beyond the MEW by encompassing a more detailed calculation of services and costs to welfare when he constructed the Economic Aspects of Welfare (EAW) for the US. Zolotas utilises the US as a case study, which is at an 'advanced' level of affluence. He examines empirically the "general deterioration of both the physical and the social environment and of human relations" over the 1950 to 1977 period, utilising both quantitative and qualitative measures (Zolotas 1981:14). The quantitative measure of "social welfare" is the EAW-index, which adjusts the national income accounts to correct for the social costs of external diseconomies and induced obsolescence (to some extent). He is interested in the symptoms of modern consumerism: large parts of relative wants are the product of persuasive salesmanship. The essay attempts to develop a global approach to the question of *social* well-being (Zolotas 1981:7): He raises the question of whether continuing growth in the mature industrial economies brought about a commensurate improvement in social welfare. He is concerned with a broadly agreeable spectrum of socio-economic phenomena associated with affluence, i.e. factors ranging from the wasteful use of natural resources to the loss of time and life due to traffic congestion in major urban centres and the social cost of environmental pollution.

Similarly to the MEW, the compilation of the EAW-index primarily relies on items from the national income accounts; especially on private consumption expenditures which have the most direct bearing on a

society's well-being. Private consumption is considered the appropriate starting point.[100] As with MEW, EAW includes the benefits of personal consumption expenditures, household services and leisure while subtracting the costs of commuting to work as a regrettable necessity. But perceptively, Zolotas concentrates on the current *flow of services*, for example, consumer durables and public buildings which were added to the annual services derived from them. He supposes that the government has so much influence on the accumulation of all types of assets. Therefore, governments play an important role when uncoordinated private purchases fall short of the socially desirable level, because they *potentially* provide service benefits (in the form of public goods) which are available effectively to anyone. Also, he considers most educational expenditures to be non-current service generation, and there is a deduction of half the costs of advertising—on the assumption that only half of it provides a valuable information service to consumers.

In the EAW, the depletion of non-renewable gas and oil reserves is regarded as a negative to sustainable welfare because they are forms of 'non-substitutable' ecological capital. To account for the long-term service loss in the EAW, the depletion of non-renewable energy is treated as any depletion of a physical capital. In addressing environmental damage, he deducts half the pollution control costs for air and water pollution and the entire cost for solid waste. The estimated damage cost of air pollution is also subtracted. Finally, he considers that much of the rise in medical expenses has been related to greater environmental stresses, and therefore half of the per capita growth in real health care costs (both public and private) is subtracted.

There are two major differences between MEW and EAW. In EAW, Zolotas simply omits business investment in durable fixed capital as a factor in 'sustainable economic welfare'. No distinction is made between real net and monetary replacement business investment. Thus, unlike the MEW, the EAW does not reintroduce investments under the category of economic sustainability. The other major difference, which is an improvement on the MEW, was that Zolotas included pollution and natural resource depletion. Environmental damages were accounted for in Nordhaus and Tobin's MEW very indirectly as an imputation for urban

[100] Personal consumption expenditures is considered the foundation of the EAW, as the GNP includes components that do not directly increase economic welfare, such as 'investments' and private health and education *defensive expenditures*. "Another class of products is that of "defensive" or corrective goods, including pharmaceuticals. It is, in fact, impossible to argue that overconsumption of drugs, for instance, enhances social welfare. To a considerable extent, excessive use of such preparations could be regarded as part of an overall effort to combat the negative effects of stressful living" (Zolotas 1981:11). Thus, 'defensive expenditures' are merely "antidotes" in the sense that they derive their value from the negative factor that is being countered, and whose existence makes them necessary. According to Fred Hirsch (1973:41), "another way of looking at the consumer intermediate goods is to see them as 'defensive' goods (sometimes termed 'regrettable necessities')".

disamenities. Zolotas, by contrast, directly addresses the issue by deducting half the pollution control costs for air and water pollution and all of them for solid waste.

Accounting for depletion of raw materials is a major contribution for a net welfare indicator. Zolotas' procedure is based on the standard economic view that non-renewable resources should rise in price at a rate equal to the long-term interest rate plus a premium for risk and user cost. Since resource prices have not in fact risen at that rate, the author reasons that the market does not function properly at setting prices for the 'optimal' depletion of resources. Thus, as part of the EAW, he deducts the difference between actual resource prices and imputed prices derived from the long-term interest rate and an estimated risk premium. Zolotas' results (not in per capita but absolute values) of the US GNP and EAW over the 1950–1977 period are summarised in *Figure. 4.3* and *Table 4.3* below:

Figure 4.3. US GNP and EAW, 1950–1977

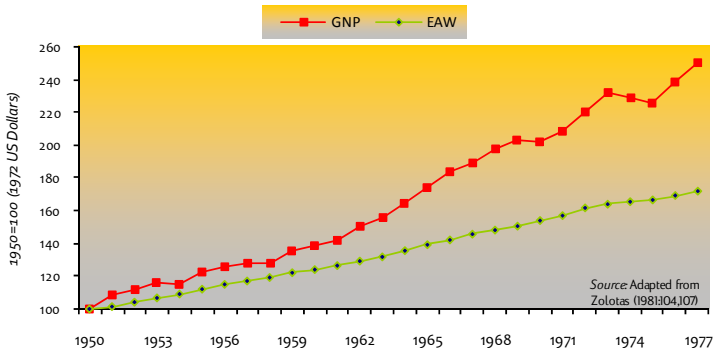
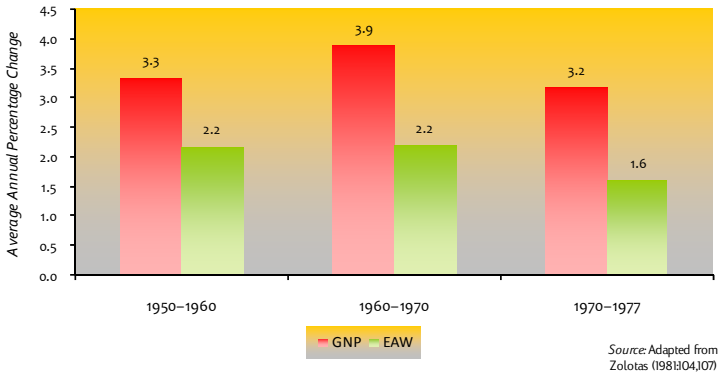


Table 4.3. US GNP and EAW (Real Growth Rates), 1950–1977



According to Zolotas' (1981) results in *Figure 4.3* and *Table 4.3* above, there is a reduction in the increasing rate of welfare over the 1970–1977 (1.6%) compared to the 1950–1970 period (average growth of 2.2%). In contrast, the average annual growth rate of US GNP was high (average of 3.5%) over the post-war 1950–1977 period. Zolotas attempts to explain

the declining trend in the EAW by offering a relatively good socio-historical analysis with empirical support of more qualitative measures. Unfortunately, he falls short on some considerable issues because the socio-historical institutional analysis is not rooted enough in the EAW indicator.

He argues that today's economic life is not the enjoyment offered by the use of modern achievements, but the everlasting effort to obtain more novel goods. These 'socially conditioned wants' aggravate people's insecurity:

> No one is liable to overlook ... the merits of a system that can ensure a sufficient supply of durable and other goods to liberate man from need and toil, provided that this process does not generate stress and anxiety instead of relief and contentment. ... [F]or instance, the fashion industry, through the subjective obsolescence of existing products, is actually a constant source of stress and dissatisfaction. Similarly, consumer durables very often fail to improve social welfare owing to their complexity and the artificial obsolescence to which they are subject. [Zolotas 1981:10,11]

Yet, the link between fashion obsolescence is weakly accounted for (e.g. one-half of advertising expenditures) in the EAW-index, and, despite that, it has little effect on the total value. Hence, the EAW-index is a weak measure of real social welfare indicator—the system is conceptually recognised but mostly de-linked from the empirical analysis. In addition, the author does not account for the distribution of income since he argues that in the US over the 1950–1977 period there was a neutral effect in income distribution for social welfare. However, at least he acknowledges the problem of distribution and fairness: "a claim to a generally fairer life, in the sense that every human being has an inalienable right to an equal share in the opportunities of a decent life" (Zolotas 1981:8). The 'distribution of income' is significant in contemporary writings on indicators of net welfare, as will be discussed in *Section 4.4* below:

4.4 The Index of Sustainable Economic Welfare (ISEW)

One of the most significant indicators of net income is the Index of Sustainable Economic Welfare (ISEW), as was introduced in *Chapter 2*, *Section 2.4*. Herman Daly and John Cobb (1989) in their landmark book, *For the Common Good*, prepared the ground into developing a more appropriate measure of welfare. They devised the very first real ISEW for the US, over the 1950–1986 period (see Cobb 1989). Their work was an

important contribution because it was the first indicator assessing economic welfare with attention to income distribution, household labour *and*, especially, environmental destruction. They argue that accounting for sustainability is critical in a measure of welfare seeing as future generations will be affected by long-term environmental damage (such as the costs of climate change). Daly and Cobb (1994) revised their book *For the Common Good* into a *Second Edition* in which they modified the United States ISEW somewhat after accounting for various criticisms raised by scholars in *The Green National Product – A Proposed Index of Sustainable Economic Welfare* (Cobb 1994, Cobb and Cobb 1994). Both of the empirical trends of the US ISEWs are examined in *Section 4.4.1* below:

4.4.1 The US ISEWs

Daly, Herman E. and John B. Cobb Jr. (1989) *For the Common Good: Redirecting the Economy Toward Community, the Environment, and a Sustainable Future*, Boston, Massachusetts: Beacon Press.

Cobb, Clifford W. (1989) "Appendix: The Index of Sustainable Economic Welfare", in Herman E. Daly and John B. Cobb Jr. (Eds.), *For the Common Good: Redirecting the Economy toward Community, the Environment, and a Sustainable Future*, First edn, Boston, Massachusetts: Beacon Press, pp. 443-507.

Daly, Herman E. and John B. Cobb Jr. (1994) *For the Common Good: Redirecting the Economy Toward Community, the Environment, and a Sustainable Future, Second Edition*, Boston, Massachusetts: Beacon Press.

Cobb, Clifford W. (1994) "Appendix: The Index of Sustainable Economic Welfare", in Herman E. Daly and John B. Cobb Jr. (Eds.), *For the Common Good: Redirecting the Economy toward Community, the Environment, and a Sustainable Future*, Second edn, Boston, Massachusetts: Beacon Press, pp. 443-507.

Cobb, Clifford W. and John B. Cobb Jr. (1994) *The Green National Product – A Proposed Index of Sustainable Economic Welfare*, Lanham and New York: University of America.

We have already detailed our interpretation of Daly and Cobb's theory in *Chapter 3*; therefore, it is not necessary to review it exhaustively again. However suffice it is to say, the authors have provided a remarkably good theory of an "economics for community" model for the ISEW. Their theory considers the costs and benefits to persons-in-community—the whole community, not merely individual agents involved in a transaction. Essentially, we argued that the crux of the ISEW is to determine whether the economy is supporting or destroying a healthy community, because the ISEW is embedded in *oikonomia*—the management of the household to increase value (service) to all members over the long-run. Daly and Cobb's community theory is commendable.

On the other hand, the authors note that 'oikonomia' suggests that no quantifiable features of the community can measure its actual health (Daly and Cobb 1989:141); consequently, they believe that it would not be practicable to include a measure of social relationships in the ISEW. Thus, the authors acknowledge the *missing element* within *their* ISEW, which is really accounting for social capital. According to Daly and Cobb (1989:379), the ISEW is derived from "contemporary mainstream economic discussion" and is *not* based on the vision they have of a 'redirected community'". This is a rather strange divorce between the community theory and the ISEW construction; indeed the authors appear

to contradict this statement when they say that *"all economic decisions should serve the common good"* (Daly and Cobb 1989:105, emphasis added). But the vision they have of a 'redirected community' must (or should) bring about the fundamentals of the theoretical framework for the ISEW, and therefore include the flow of services from social capital, indeed all forms of capital.

However after scrutinising their ISEWs, it is self-evident that Daly and Cobb's (1989, 1994) notion of persons-in-community is absent in the indicators' theoretical underpinning. The groundwork of the "person-in-community" is effectually isolated from their analysis of the ISEW trends. That is, the conceptual linkage to their empirical and historical applications of the US ISEW is inadequate. The theoretical framework supporting the ISEW is mistily derived. Subsequently their overall mark out of ten on the 'theory component' will be low. With this major caveat in mind, nevertheless, we will proceed with an analysis of the empirical evidence for their US ISEWs in comparison with GDP growth.

When comparing the trend of GNP with the net welfare indicator, only *changes in* the ISEW over time can be meaningfully interpreted (e.g. see Dietz and Neumayer 2006b:201). This is because the absolute level of the ISEW crucially depends on choosing a base year for indexing as the reference point, i.e. the ISEW is weighted by an index for income inequality, whereas GNP is not.[101] Unless stated otherwise, this study considers the *real* (constant price) *trends* of the indicators rather than their absolute monetary values.[102] In the Appendix of the First Edition of *For the Common Good*, Clifford Cobb (1989) has calculated a per capita US ISEW for the 1950–1986 period. The results of the real trends of US GDP per capita and ISEW over the 1950s to mid-1980s are presented in *Figure 4.4a* and *Table 4.4a* on page 125. As indicated below, there is a clear deviation in the trend between GDP and the ISEW per capita since the mid-1970s for the US. In the 1950s and 1960s, the annual growth rates of US ISEW per capita averaged around 2.1%, however, during the 1970s to mid-1980s, there were negative annual growth rates (an approximate mean of –0.5%). These results suggest that economic welfare was more sustainable and equitable in the 1950s and 1960s in comparison to the 1970s and 1980s.

Also, during the 1950–1990 period, the results in Cobb and Cobb (1994) of the revised US ISEW portray a similar divergence between GDP growth and welfare, as shown in *Figure 4.4b* and *Table 4.4b* below:

---

[101] Due to the indexing, the resulting ISEW cannot be interpreted as the income that society can safely consume and be as well off at the end of the year as at the beginning.

[102] Similarly as Clarke (2006b:175) says, in relation to his Thailand study between GDP and the ISEW, that "[i]t is important to realise that although both indices are money-metric, they are not cardinal in nature. ... [I]t is possible to infer from these two time series a distinct variation and divergence in the two lines ... by normalising both indices and starting both per capita GDP and ISEW per capita with an index of 100.0 [in the base year of the study]". The same normalisation procedure is adopted in this study.

Figure 4.4a. US GNP and ISEW, 1950–1986

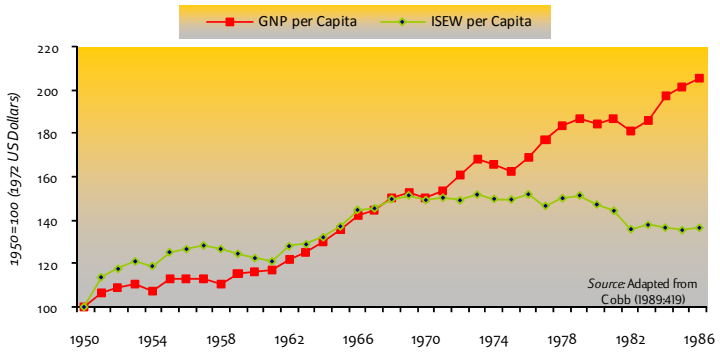


Table 4.4a. US GNP and ISEW (per Capita Real Growth Rates), 1950–1986

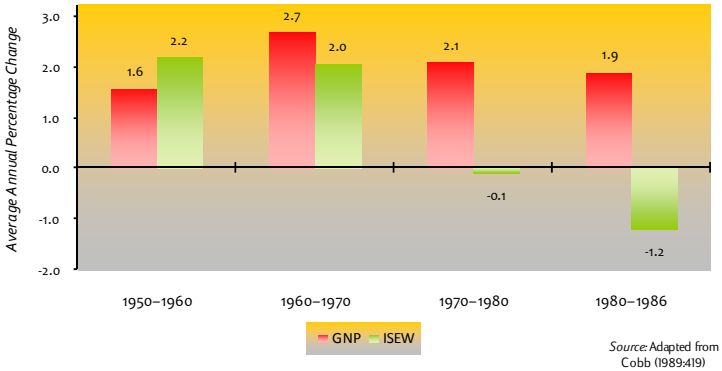


Figure 4.4b. US GNP and ISEW, 1950–1990

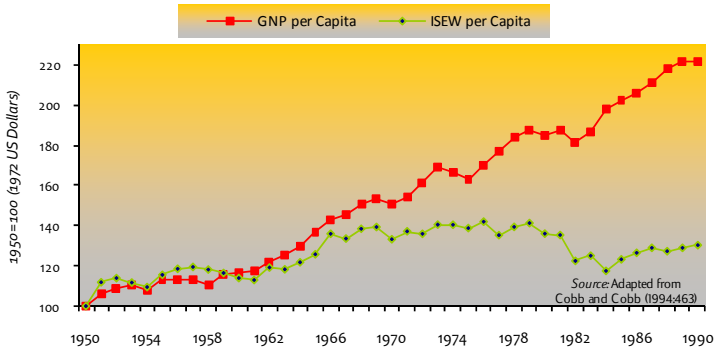
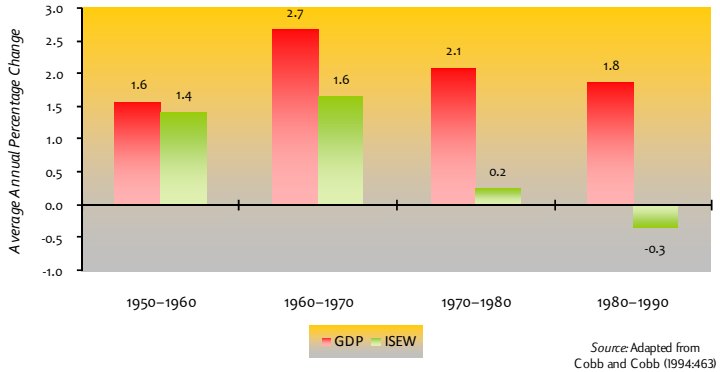


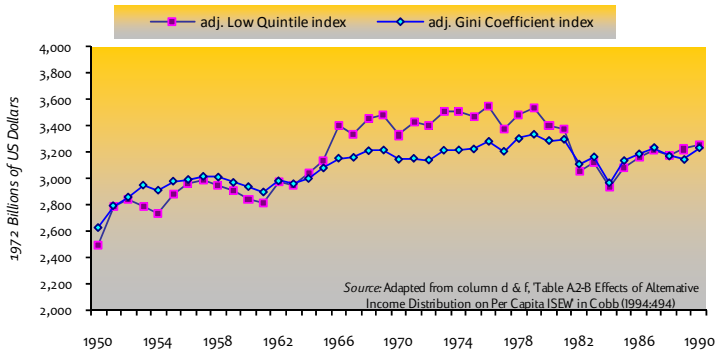
Table 4.4b. US GNP and ISEW (per Capita Real Growth Rates), 1950–1990



Overall, the average annual growth rates of the revised ISEW are a bit less pronounced than the original US ISEW: growth in the revised ISEW per capita was not as strong during 1950s and 1960s and not as negative in the 1970–1990 period. Yet, in both cases, the ISEW per capita grows strongly during the 1950s and 1960s, indicating that there was good (positive) progress in net welfare. But, net welfare declined significantly as indicated by the stagnating trend in sustainable economic welfare since the late 1960s, and the gap between GNP and ISEW has become larger since the mid-1970s.

Note that the ISEWs above were adjusted via the "Quintile index". The quintile index calculates variations in the share of income by the lowest quintile. The rationale for this method is that improvements in the lot of the poorest segment of society are the most significant, as the relative benefit of additional income is (presumed) greater for them than for others. The author's preference is to utilise the low quintile index, rather than by adjusting the ISEW by the Gini coefficient, as it gives special weight to the plight of the poorest members of society. The Gini gives the difference between actual distribution and equal distribution. But, what effect does the choice of distribution method have on the trend of the ISEW? The variation in the trend between the per capita ISEW adjusted via the Gini coefficient and the ISEW adjusted via the low quintile method is rather marginal, as shown in *Figure 4.4c* below:

Figure 4.4c. US per Capita ISEW adjusted for Income Inequality, 1950–1990



In other words, depending on the chosen technique of the 'income inequality' component of the ISEW, it is subject to some variation in describing the reality of the underlying national accounting position, particularly during the mid-1960 to 1980 period.

However, regardless of the differences between the various income distribution adjustments, there still is a noticeable flattening (and eventual decline) in the level of per capita welfare experienced by the average US citizen, particularly since the 1970s. As the authors explain, the main components explaining the decline in economic welfare and the

widening of the gap between GNP and the ISEW for the US, in both instances, were the rising costs of global warming, income inequality, defensive health expenditures (e.g. stress), natural resource depletion and reduced household production. It is good to see that the author has a reasonably good historical description of the path of ISEW relative to GDP. Thus, the Cobb (1989, 1994) US ISEW studies indicate that economic welfare in the US has not occurred during the 1970s–1990s because of rising environmental pollution, income inequality and natural resource depletion.

4.4.2 German ISEW

Diefenbacher, Hans (1994) "The Index of Sustainable Economic Welfare: A Case Study of The Federal Republic of Germany", in Clifford Cobb and John B. Cobb Jr. (Eds.), *The Green National Product – A Proposed Index of Sustainable Economic Welfare*, Lanham and New York: University of America.

There has been more than fifteen years of an ongoing discussion in the Federal Republic of Germany (FRG) on the value of the GNP as a measure of economic and social welfare. Hans Diefenbacher, an economist at the Protestant Institute for Interdisciplinary Research (Heidelberg) sought to go beyond previous efforts (see Rubik 1985) to develop for the first time an ecologically-oriented national bookkeeping measure for Germany. These earlier publications did not include a critical assessment of the long-term consequences of production and consumption activities, i.e. they did not adequately incorporate the dimension of 'sustainability'. Hence, Diefenbacher (1994) sought to construct an ISEW for FRG, 1950–1987. However, he also had another objective in mind, and that was to understand the conditions for international comparisons of welfare measures, specifically with the US ISEW (by Cobb 1989 in Daly and Cobb 1989). He provides no theoretical framework for the ISEW and no strong institutional apparatus, as he is simply concentrating on the empirics of an ISEW for the FRG.

The FRG-ISEW centres on the sustainable economic welfare of the German 'household'. Since Diefenbacher was proposing an international comparative study with the US ISEW (1950–1986), the compilation of the components in the FRG-ISEW (aka German ISEW) were technically similar to that of Daly and Cobb (1989), i.e. where the usual column-based positive and negative adjustments from the "personal consumption expenditures" component take place. The author utilises national statistical sources (e.g. welfare surveys and statistical yearbooks) to estimate the ISEW for Germany over the 1950–1987 period; albeit he notes severe data difficulties encountered over the thirty-seven year period (see Diefenbacher 1994:217). His results of the German GDP per capita and ISEW are shown in *Figure 4.5* and *Table 4.5* below:

Figure 4.5. German GNP and ISEW, 1950–1987

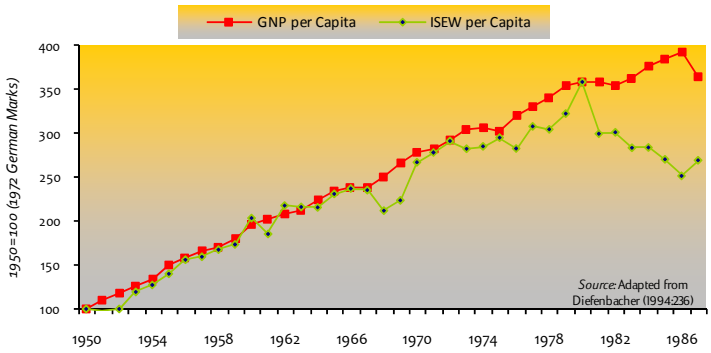
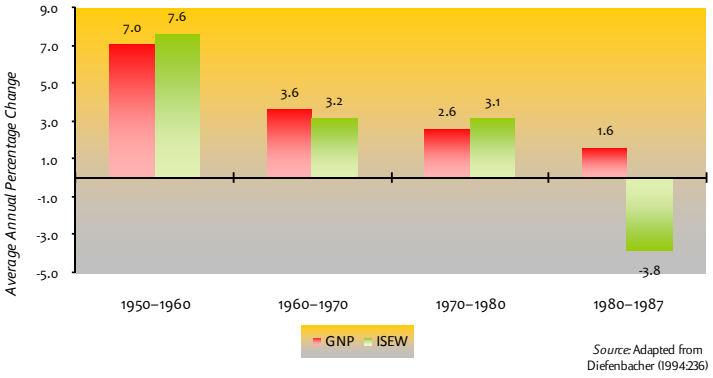


Table 4.5. German GNP and ISEW (per Capita Real Growth Rates), 1950–1987



In the period between 1950 and 1980, the per capita trends of GNP and the ISEW paralleled each other and moved sharply in an upward direction, where strong positive per capita average annual growth rates prevailed, especially during the 1950s. However, this changed drastically after 1980, where we find slow growth of GNP but very negative growth of ISEW. The two most influential factors in the benefit and cost columns were household services and long-term environmental damage. The sharp decline in per capita German ISEW since the 1980 peak are due to declines in net capital growth, net international position, and personal consumption expenditures; higher income inequality; as well as the detriments to welfare from the cumulative negative effects of soil degradation and of long-term environmental damage.

A criticism of the paper is that Diefenbacher's (1994) household labour statistics are inflated because he assumes that the value of housework keeps pace with growth of GNP. This assumption does not fit with patterns experienced in household and market activities in other advanced countries such as the US, because there has been a general shift from the household economy to the market economy. For instance, note the movement of increasing numbers of women into market employment and a growth in single person households (with fewer housework and child-care demands). Therefore, generally the value of

housework does not keep pace with the growth of GNP (see Cobb and Cobb 1994:259).

Diefenbacher's (1994) work is the first ISEW calculated for Germany and the first study undertaken since Daly and Cobb (1989). It is therefore an important step forward in historically exploring the FRG's past vis-à-vis sustainable economic welfare. An important result from Diefenbacher is that the monetary statistics developed to calculate an ISEW in various countries are not entirely comparable. Nonetheless, all international economic comparisons are approximations because categories differ between nations. Yet, there is some validity in comparing the growth rate trend between countries (see Diefenbacher 1994: Table B.10.7, "Growth Rates of [US and FRG] ISEW Variables", 1950–1986).

It is very interesting to note that the author examines FRG-ISEW in the context of the business cycle, albeit he does not have a thorough analysis (see Diefenbacher 1994:228). The results over the study period suggest that FRG-ISEW is more sensitive to the changes of the business cycle than GNP, where the amplitudes of ISEW are greater than that of GNP. This is mainly visible in the "economic dip" of 1967/68 and the oil crisis of the year 1973. The responsiveness of the sustainable economic welfare indicator is not completely synchronised with the fluctuations of GNP; yet only a minor lag for ISEW is evident. Understanding the cyclical nature of the system is critical in political economy. Hence, regardless of the author's somewhat limited assessment of these issues, from a political economy point of view the level of historical specificity is a key highlight of the paper.

4.4.3 UK ISEWs

Jackson, Tim and Nic Marks (1994) *Measuring Sustainable Economic Welfare: A Pilot Index for the UK 1950–1990*, Stockholm: Stockholm Environment Institute, New Economics Foundation.

Jackson, Tim, F. Lating, A. MacGillivray, Nic Marks, J. Ralls and Susanna Stymne (1997) *An Index of Sustainable Economic Welfare for the U.K. 1950–1996*, Guildford: University of Surrey, Centre for Environmental Strategy.

Jackson and Marks (1994) have constructed an ISEW for the UK over the 1950–1990 period. This was the first ISEW study for the UK. Later, Jackson *et al.* (1997) updated their efforts and reconstructed a revised UK ISEW for the 1950–1996 period. Both UK studies will be considered here because of their similar methodological approach.

The authors argue that welfare or well-being is not wholly determined either by economic output or by material consumption. Much depends on what we consume and how we consume it. However, they state that the conventional GDP$_E$ (expenditure approach) methodology adds up all public and private "final" consumption and investment expenditures on goods and services. They recall Hicks (1948:172): that the purpose of income calculations in practical affairs is to give people an indication of the amount which they can consume without impoverishing themselves in the future. To some extent, the Net Domestic Product (NDP)

addresses this issue by incorporating an adjustment for economic depreciation. NDP is equal to consumption plus net investment and (exports minus imports). 'Net private and public investment' and 'exports minus imports' offer an indication of the changes in the stock of durable fixed capital on which future consumption possibilities rest, and the stability of the national international position, respectively.

Yet, a number of problems remain within the GDP/NDP accounting framework such as the narrowness of the system boundary applied in economic practice. That is, the boundary excludes a number of non-market goods and services such as environmental amenities and household production that contribute to present welfare. They justify the need for an ISEW because "an adjusted measure would attempt to include some of the important environmental and social factors which clearly contribute to welfare but which are omitted from the conventional accounts" (Jackson *et al.* 1997:1). The authors attempt to measure *net* welfare by extending the national accounts to incorporate various environmental and social aspects—albeit they do not provide an integrated theoretical foundation to account for these factors in their ISEW.

Roughly, the same methodology for the US ISEW by Cobb and Cobb (1994) has been transposed to the original UK ISEW (Jackson and Marks 1994) and to the majority of the revised UK study by Jackson *et al.* (1997).However, the 1997 paper has some important technical revisions to the original methodology such as modifying the 'income distribution index' and the 'costs of ozone depletion' items.[103] The authors' results of the original UK ISEW per capita and the updated ISEW (with the GNPs) are presented, respectively, in *Figures 4.6a,b* and *Tables 4.6a,b* on page 131. In both cases since mid-1970s, the following negative contributions led to the noteworthy decline in the ISEWs for the UK economy: a sharp reduction in durable fixed capital investments; changes in the balance of trade; and a greater difference between expenditures in and the service flow from consumer durables. These predominant factors, plus the cumulative effect of rising income inequality and long-term environmental damage over the whole period, explain the widening gap between GDP and measured welfare.

Overall, both UK ISEW studies confirm the general pattern emerging from similar ISEW studies in other European nations: while economic output continues to rise, sustainable economic welfare has begun to stabilise and then decline in recent decades (1980s–1990s). Note that there has been a slightly less dramatic picture of the change in net welfare in the revised UK ISEW compared to the pilot study, particularly over the 1974–1979 period. However, in both of these studies, the authors do not scrutinise the long-term trend of the ISEW.

[103] The technical achievements of the UK ISEWs are explored in more detail in *Chapter 5*.

Figure 4.6a. UK GNP and ISEW, 1950–1990

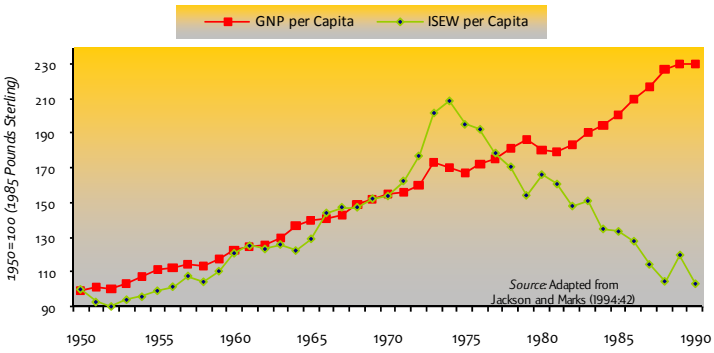
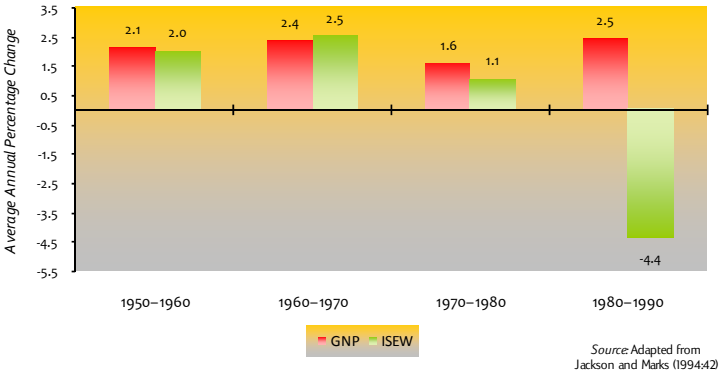


Table 4.6a. UK GDP and ISEW (per Capita Real Growth Rates), 1950–1990



Source: Adapted from Jackson and Marks (1994:42)

Figure 4.6b. UK GDP and ISEW, 1950–1996

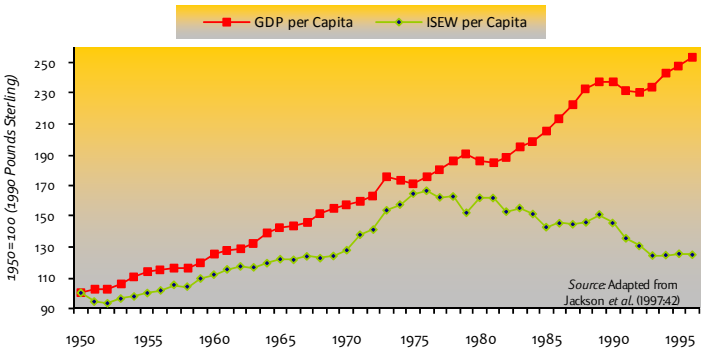
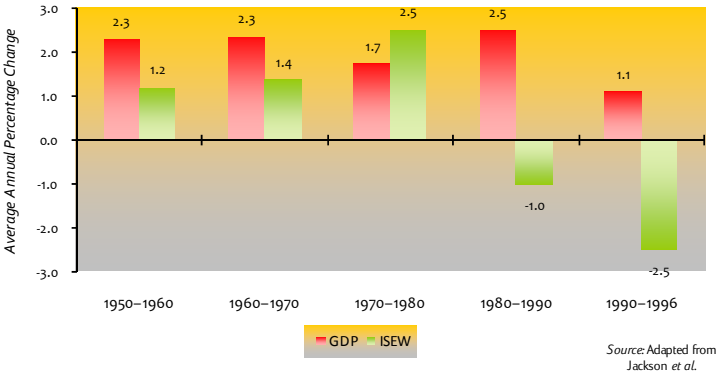


Table 4.6b. UK GDP and ISEW (per Capita Real Growth Rates), 1950–1996



Source: Adapted from Jackson *et al.*

The authors fall short in their critical analysis of the Great Britain experience in the world economy, because they disengage from the major global financial and economic cycles over the second half of the twentieth century.

4.4.4 Scottish ISEW

Moffatt, I. and M.D. Wilson (1994) "An Index of Sustainable Economic Welfare for Scotland, 1980–1991", *International Journal of Sustainable Development and World Ecology*, vol. 1, pp. 264-291.

Moffatt and Wilson (1994) conclude—after reviewing the empirical works of the MEW and EAW—that an alternative measure of net welfare must be devised. That is, according to the authors, a full account of natural resources and the negative welfare costs associated with economic activity is required in a single indicator. The authors believe that a declining GNP has connotations of job losses, home repossessions, recession and a government that is not fit to run the economy of a country (Moffatt and Wilson 1994:265). Therefore, Moffatt and Wilson (1994) have deemed it significant to construct a Scottish ISEW (in pounds sterling, 1985 prices) for the 1980 to 1991 period. This is the first ISEW constructed for Scotland.

Their results for the Scottish GDP per capita and ISEW are shown in *Figure 4.7* and *Table 4.7* below:

Figure 4.7. Scottish GDP and ISEW, 1980–1991

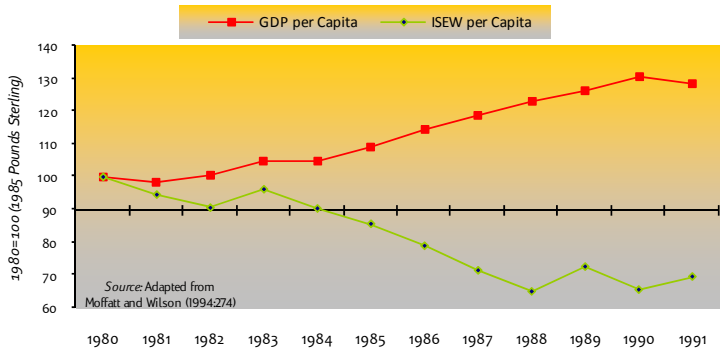
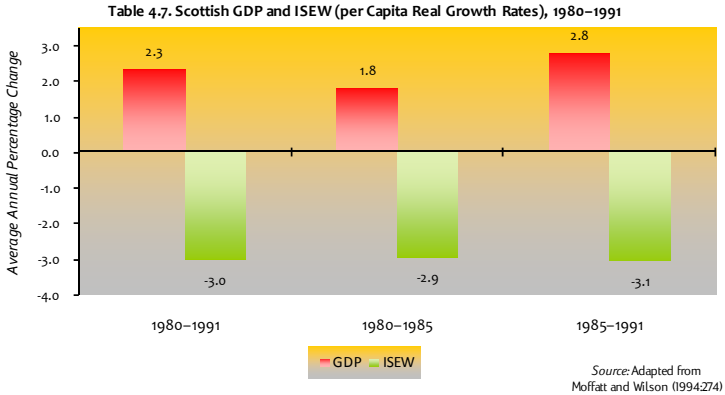


Table 4.7. Scottish GDP and ISEW (per Capita Real Growth Rates), 1980–1991



They argue that the ISEW is not a measure of social welfare, but an improved measure of Hicksian income (Moffatt and Wilson 1994:266). The authors are simply interested in assembling a single net income index for Scotland; theorising about it is not a priority or a consideration for that matter. In their construction of a Scottish ISEW, they have utilised similar methods to the works of Cobb and Cobb (1994) (US ISEW) and Jackson and Marks (1994) (UK ISEW). Interestingly, the Scottish ISEW is comparable to the Jackson and Marks' (1994) UK ISEW. For instance, over the 1980 to 1990 period, per capita ISEW for the UK declined from 1831£ to 1136£ (38%), while for the same period per capita ISEW for Scotland dropped from 1643£ to 1075£ (35%). UK GNP per capita rose by 27% and GDP per capita for Scotland rose by 30% during the same phase (1980–1990). The good news is that these are consistent results. However, Moffatt and Wilson (1994) provide no explanation of the link between the business cycle and degradation of social and environmental welfare over the 1980–1991 period.

4.4.5 Dutch ISEW (1)

Rosenberg, David, Tammo Oegema and Marcel Bovy (1995) *ISEW for Netherlands: Preliminary Results and Some Proposals for Further Research*, Amsterdam: ISMA, Instituut Voor Milieu-En Systeemanalyse.

This study by Rosenberg *et al.* (1995) calculates the first ISEW for the Netherlands. They are the first authors to include the 'cost of unemployment' in the ISEW. But they provide no theoretical framework. They argue that the ISEW can be viewed as a one-step process of highlighting the failure of the current economic system and generating support for more advanced analytical tools and political change. Along with GNP, an ISEW per capita for the Netherlands is calculated over the 1950–1992 period, as shown in *Figure 4.8* and *Table 4.8* on page 134. The ISEW per capita grows very strongly in the 1950s, 1960s and 1970s, but then slows down somewhat during the 1980s and early 1990s. The authors explain that decline in the ISEW can be attributed to three factors: 1) recession in the early 1980s and 1990s that reduced personal consumption; 2) increasing costs of social and environmental damage; and 3) increasing income inequality and stagnation of real wages in the lower income brackets. These are interesting results. Unfortunately, this is a brusquely written article because of the lack of any real lively discussion of the Netherlands' socioeconomic and ecological situation. For instance, the authors are not interested in examining the relatively momentous growth rates of "sustainable" economic welfare per capita in the 1960s (see *Table 4.8* below). Hence, focusing on 'the gap' between GNP and the ISEW has led to an unbalanced application of the real situation of the Dutch economy.

Figure 4.8. Dutch GNP and ISEW, 1950–1992

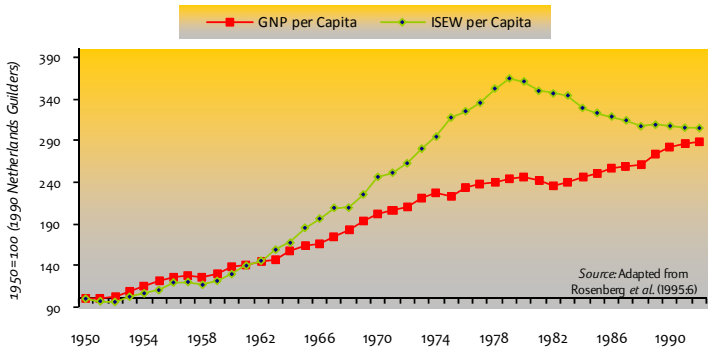
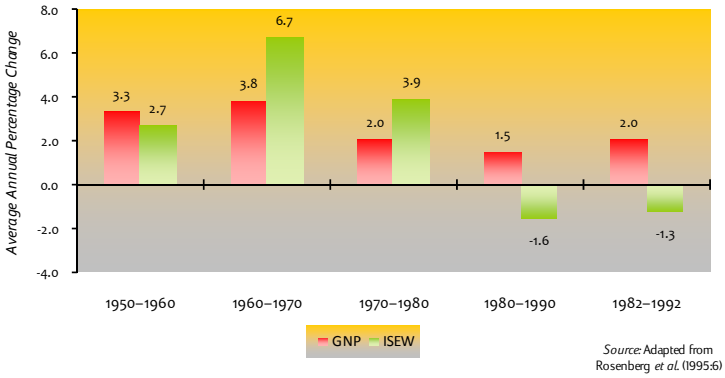


Table 4.8. Dutch GNP and ISEW (per Capita Real Growth Rates), 1950–1992



4.4.6 Swedish ISEW

Jackson, Tim and Susanna Stymne (1996) *Sustainable Economic Welfare in Sweden: A Pilot Index: 1950–1992*, Stockholm: *Stockholm Environmental Institute*.

The objective of Tim Jackson and Susanna Stymne's research was to develop an ISEW for Sweden, 1950–1994. This is the first ISEW study for Sweden. They argue that construction of an ISEW is a fruitful exercise, especially for an international comparison of policy-based outcomes. They compare their trend results with other countries, chiefly the UK. To facilitate an international comparison, they follow as closely as possible the methodology already set out in the previous studies by Daly and Cobb (1989)—i.e. modifying the concept of Hicksian income to measure 'sustainability'. As in Cobb (1989:404) they have excluded changes in human capital, that is improvements in human physical (health), intellectual (educational) and emotional resources. But, the authors have overlooked Daly and Cobb's "economics for community" model.

Their results for the Swedish GNP per capita along with ISEW for the 1950–1992 period are presented in *Figure 4.9* and *Table 4.9* below:

Figure 4.9. Swedish GNP and ISEW, 1950–1992

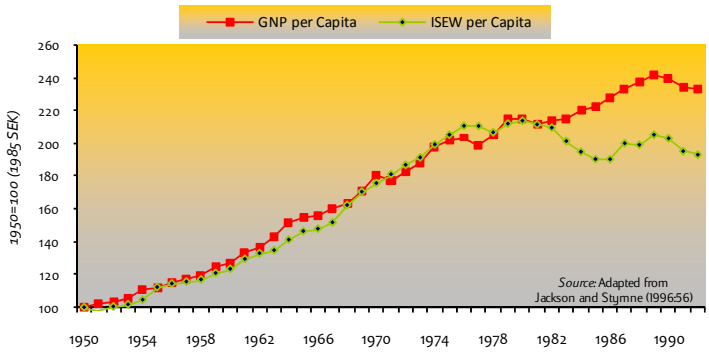
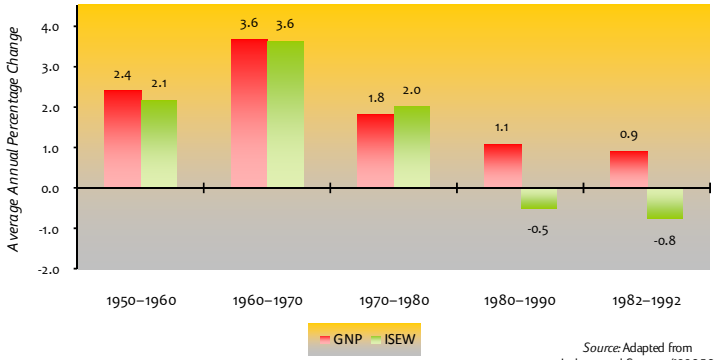


Table 4.9. Swedish GNP and ISEW (per Capita Real Growth Rates), 1950–1992



ISEW per capita grew at similar rates to GNP per capita during the 1950s, 1960s and 1970s, easily keeping pace with economic growth during the golden decade, and staying ahead of it (slightly) during the initial period of the ensuing economic decline. The index of income inequality fell about 30% over the whole period, which had a positive effect on the level of net welfare. The loss of natural capital (e.g. resource depletion, loss of farmlands etc.) and the costs associated with long-term environmental damage (including the costs of ozone depletion) both increased substantially over the whole (1950–1992) period. Eventually the accumulative effect of this destruction of ecological capital led to a modest decline in the ISEW since the early 1980s.

Jackson and Stymne (1996:5) observe that history shapes the Swedish *economic* experience during 1950–1992. That is, the authors give various details (on page five) about the trend of economic growth in the years immediately following the Second World War to the time of writing the paper. In the 1950s, Sweden experienced rapid export-led growth, albeit GDP growth was slowed to some extent by the Korean War inflation and cyclical downturns. Industrial output was very strong *and* sustained in the "golden decade" of the 1960s, but the aggregate rate of economic growth slowed down eventually due to the oil crises of the mid-1970s and the deep recession of the early 1980s. The economy as a whole recovered

during 1982–1989 because of the expansion of the service sector and the devaluation of the Swedish krona in the early 1980s—but this growth was short-lived. "The most severe and the longest recession since the 1930s hit Sweden (along with many other western countries) in 1990, and for the years between 1990 and 1992, annual growth rates averaged –0.7%" (Jackson and Stymne 1996:5). The major problem with the authors' business cycle analysis is that they overlook the real historical linkage between ISEW *and* GDP growth/decline. Apart from during the 1983–1986 period where clearly GDP and ISEW moved in opposite directions, the two trends of the indicators virtually followed the same path in 1950–1992, growing in sustained decadal boom times and lessening in times of deep recessions (*cf. Table 4.9* above).

However, this vital oversight can be partly disregarded because the authors have a good international comparative analysis. The divergence between the Swedish ISEW and GNP per capita over the 1980s and early 1990s is much less noticeable than in the UK and US studies, which is mainly explained by the distributional index (see Stymne and Jackson 2000:225). For instance, the Swedish ISEW demonstrates a considerably less 'downturn' and smaller gap between the ISEW and GDP than the UK ISEW study by Jackson *et al.* (1997). This is likely because of Sweden's progressive stance on welfare and the environment. Indeed, unique within the Swedish ISEW was high levels of private consumption expenditures *and* non-defensive government expenditures. These changes reflect a deliberate orientation of Swedish domestic policy towards the creation and maintenance of social welfare: progressive taxation rates; high rates of national insurance payment; state responsibility for health and social services; extensive social security, pension rights, disability, maternity and paternity benefits; and an ambitious labour market policy to reduce unemployment (see Jackson and Stymne 1996:7).

The authors acknowledge some of the limitations of their study. For example, the Swedish ISEW does not include the *costs* of hydropower, even though Sweden has one of the highest contributions from hydropower amongst any of the developed nations. "This form of electricity generation is not without adverse environmental impacts, but from the point of view of the ISEW it represents a fortuitous benefit, since the costs of these impacts are not quantified in the index" (Jackson and Stymne 1996:45). They conclude that "as a tool for examining the influence of social and environmental factors on economic welfare, the ISEW continues to play a valuable and critical role" (Jackson and Stymne 1996:46). Sweden had pursued progressive policies in alleviating distribution inequalities, and, thus, when comparing the UK and Swedish ISEWs its policy effectiveness is evident. Sweden has a better socio-political performance than other developed nations. It is good that

Jackson and Stymne (1996) have provided a reasonably good socio-historical analysis.

4.4.7 Austrian ISEW

Stockhammer, Engelbert, Harald Hochreiter, Bernhard Obermayr and Klaus Steiner (1997) "The Index of Sustainable Economic Welfare (ISEW) as an Alternative to GDP in Measuring Economic Welfare. The Results of the Austrian (Revised) ISEW Calculation 1955–1992", *Ecological Economics*, vol. 21, pp. 19-34.

Stockhammer *et al.* (1997) attempt to show that GDP is an unsatisfactory indicator of economic welfare by empirically calculating an ISEW for Austria, 1955 to 1992. This is the first ISEW study for Austria. They make some significant theoretical contributions to the ISEW. For instance, the development of the "potential defensive costs" is an original contribution to the ISEW literature (discussed below). The authors seek to reformulate the Daly and Cobb ISEW by improving inner consistency and clarity in structure. Stockhammer *et al.* (1997:22) state that the ISEW follows an extended version of Hicks' definition of income. In their view, the ISEW is committed to the idea of an environmentally sustainable economic development as well as to social justice. They have some elements of the theories, 'economics for community' (linking to the "principle of internalization") and the 'social welfare function' (individual vs. the social choice).

The authors intend not to measure potential defensive costs or the damage itself, but the *economic* aspect of it, e.g. the reaction to the damage or repair damages as measured by monetary expenditures. They note the role of prices in their ISEW:

> Market prices from a Marxian perspective do not measure economic welfare directly, but the effort to produce it.[104] As the commodities sold have use value (otherwise they would not have been bought), more products can be interpreted as more economic welfare. [Stockhammer *et al*. 1997:25]

To express these costs they used actual or potential defensive costs. 'Potential defensive costs' are defined as:

> costs that would have occurred if society had reacted to environmental devaluation in the same way (concerning one 'unit of pollution') as it reacts today ... [and] give a consistent estimation of loss in economic welfare as they depart from actual expenditures, and use physical indicators to reconstruct past welfare losses. [Stockhammer *et al*. 1997:23]

[104] This is an interesting hypothesis, but no SEWI advocate has specifically incorporated this worldview nor offered any critical scrutiny.

Accounting for 'potential' defensive expenditures in addition to 'actual' ones is critical: "[l]ow [actual] defensive expenditures can be caused by either a low social awareness of environmental problems or a low level of pollution" (Stockhammer *et al.* 1997:23). The inclusion (and distinction between) actual and potential defensive expenditures strengthens the conceptual foundation of the ISEW.

The results of the Austrian GNP per capita and ISEW over the 1955–1992 period are shown in *Figure 4.10* and *Table 4.10* below:

Figure 4.10. Austrian GNP and ISEW, 1955–1992

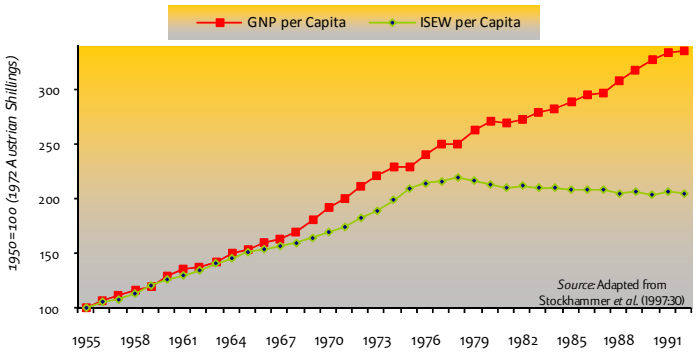
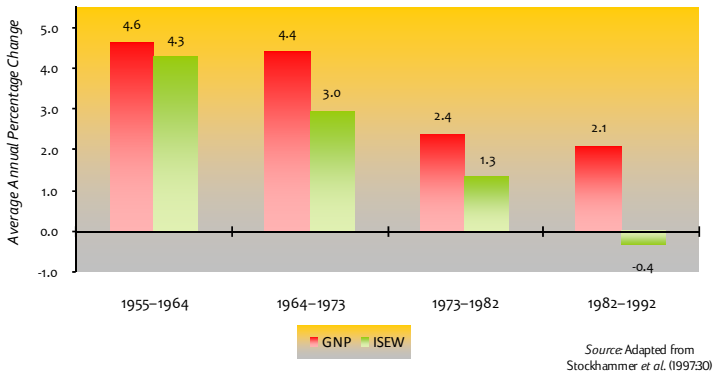


Table 4.10. Austrian GNP and ISEW (per Capita Real Growth Rates), 1955–1992



For the Austrian ISEW, up to the late 1970s, GDP slightly overestimates the growth of sustainable economic welfare, but from 1982 to 1992, it has become misleading as a proxy for welfare. Long-term environmental damage has been growing much faster in the 1980s. Income distribution has worsened during the last decade of the period of study, and there has been a substitution between household production and private consumption.

The authors of the Austrian ISEW make a crucial remark regarding the use of monetary values placed on multidimensional ecological and social phenomenon. They realise that the monetary value given to the subtraction items has to be seen as distinct from the phenomenon it

stands for; the defensive costs are merely the monetary equivalent of the reaction to the environmental damage:

> Since it implies expressing non-monetary phenomena in monetary terms, it usually implies a loss of information. A complex phenomenon is reduced to just one dimension. ... [I]t can give one the illusion that everything is exchangeable for money, which is obviously not correct[, as] money neglects their qualitative aspects. [Stockhammer *et al.* 1997:23,33]

In addition, they recognise the following limitations: measuring household labour via market prices neglects its specificity as a social relation; and relocating polluting industries to other countries count as a positive development.

Moreover, the authors subtly suggest that ISEW is limited in its empirical application to understanding welfare progress in the capitalist system:

> Up to now the ISEW does not cover the costs of the capitalist mode of production, where labor is extracted from labor power (Bowles 1985). ... Bowles *et al*. (1990) suggest that huge losses are due to this hierarchical organization of the production process. ... [This critique] questions the ISEW as [a] whole. [Stockhammer *et al*. 1997:33]

What do their conclusions imply for the ISEW? Thus far, they are the only authors to recognise the limitations of the ISEW in the context of capitalism—Stockhammer *et al.* (1997) understand, to some degree, the system that we currently have. It is interesting that the authors have not only contributed to the ISEW's theoretical foundations but also furnished a critique of the ISEW. Will we see this type of critical analysis of theory and critique in the proceeding sections?

4.4.8 Italian ISEW

Guenno, Giorgio and Silvia Tiezzi (1998) *The Index of Sustainable Economic Welfare (ISEW) for Italy*, University of Siena, Department of Economics. Nota Di Lavoro (Working Paper).

Guenno and Tiezzi (1998) construct an ISEW for Italy for the 1960–1990 period. This is the first Italian ISEW study. According to the authors the primary purpose was to test whether the general (declining) trend of the US, UK and German ISEWs is verified in Italy. They also attempt to improve on some methodological shortcomings in the original Cobb (1989) ISEW, but give no theory. They stress that all the variables in the Italian ISEW are *flow* variables and none of them are stock variables.

Their results for the Italian GDP per capita and ISEW over the 1960–1990 period are shown in *Figure 4.11* and *Table 4.11* below:

Figure 4.11. Italian GDP and ISEW, 1960–1990

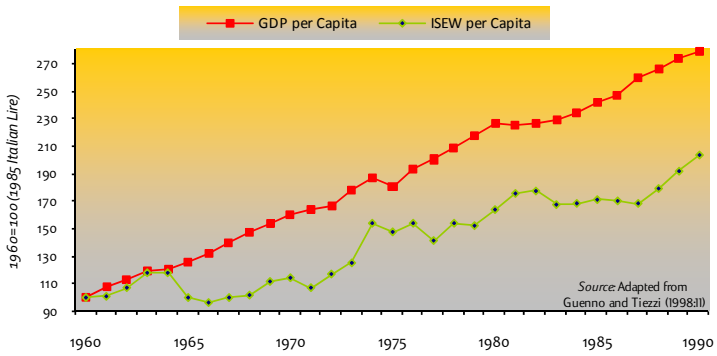
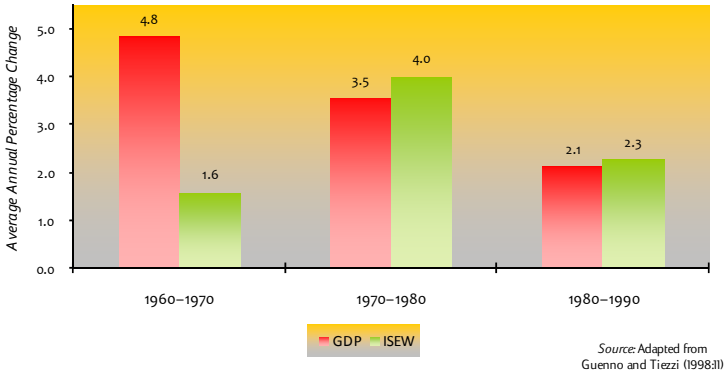


Table 4.11. Italian GDP and ISEW (per Capita Real Growth Rates), 1960–1990



Over the 1960–1990 period, the long-run negative components of future welfare (loss of agricultural land, long-term environmental damage) have been growing much faster than the 'consumption base'. However, the results above show that the decreasing ISEW trend after the 1970s as registered for some other countries is not significant for Italy. The primary environmental variables such as the cost of air, water and noise pollution and the loss of wetlands appear to be rather stable over the period of study. In addition, the weight of "exhaustible resources consumption" is negligible as compared to the other environmental variables—Italy has very low stocks of exhaustible natural resources. Thus, these generally 'positive' environmental circumstances prevent the trend in the Italian ISEW from declining (as in the case for the majority of other country studies, e.g. US, UK and Germany).

Interestingly, the authors note that personal consumption expenditures are rising at a faster rate than the services flowing from the stock of consumer durables: "[this] seems to indicate an ever growing 'commodification' ... of durable goods" (Guenno and Tiezzi 1998:11). Unfortunately, the authors fail to afford a substantive account of the

'commodification' problem in the Italian ISEW. In addition, they ignore the fluctuations in the business cycle and provide no historical specificity concerning periods of intense economic, social and ecological development, e.g. in the early 1960s, 1970s and the late 1980s (see *Figure 4.11* above).

4.4.9 Chilean ISEW

Castañeda, Beatriz E. (1999) "An Index of Sustainable Economic Welfare (ISEW) for Chile", *Ecological Economics*, vol. 28, pp. 231-244.

The author, Beatriz Castañeda, constructs an ISEW for Chile for the 1965–1995 period as a case study into environmental sustainability and economic growth. She contributes the first ISEW study for Chile, which is thought of as a 'developing' country. No specific theory is provided at the beginning of the study, generally the author follows the typical methodological framework put forward by Daly and Cobb (1994), Jackson and Stymne (1996). Yet, at the end of the study, she recognises several limitations of ISEW. It assumes that welfare is proportional to consumption. The index omits human capital. Also, "[s]ome of the defensive expenditures calculated have a very local effect; therefore, it is not obvious how to extrapolate for the rest of the country" (Castañeda 1999:238). In other words, significant fragments of information can be lost in translation when constructing these national-centric indicators of net-consumption.

She provides a good ecological-historical background before constructing the Chilean ISEW. A comparative analysis between GDP and ISEW is potentially valuable for the following reasons: the country has undergone market reform (trade liberalisation, privatisation); has powerful private sectors; and made the transition to electoral democracy (in 1990). Overall, the cyclical patterns between growth of GDP and ISEW are broadly comparable during 1965–1985 and 1990–1995, as shown in *Figure 4.12* and *Table 4.12* on page 142. Sustainable economic welfare of the average person was relatively worse than GDP per capita during the 1970–1975 and 1980–1985 periods (see *Table 4.12*). The author points out that Chile experienced deep recessions during the 1973, 1975 and 1981–1983. That is, the fluctuations in ISEW are stronger than GDP during the downswing periods of 1970–1975 and 1980–1985, suggesting that Chilean people were hit hard. In the 1985–1990 period, GDP growth per capita recovered, with an average annual change of 4.3%, but ISEW was stagnant, with a mean annual decline of 0.4%. The Chilean economy recorded strong GDP and productivity growth performance in industry and services sectors during the 1990s. ISEW for Chile recovered in the early-to-mid 1990s when economic growth was also strong.

Figure 4.12. Chilean GDP and ISEW, 1965–1995

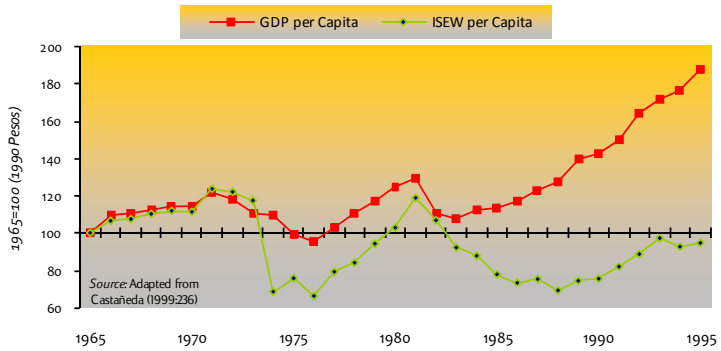
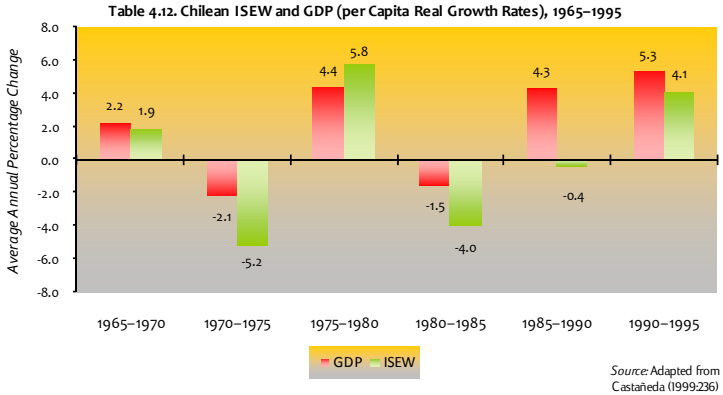


Table 4.12. Chilean ISEW and GDP (per Capita Real Growth Rates), 1965–1995



Castañeda arrives at a somewhat challengeable conclusion: "[e]specially since the 1980s, Chile has been on a *non-sustainable path*, and welfare has not increased over the last 30 years" (Castañeda 1999:242, emphasis added). But according to the authors' results, Chile seems to be on a "sustainable" path in 1990–1995 with an average annual growth rate of ISEW per capita of 4.1%. This occurred at the same time when the Chilean economy grew strongly, with an average annual percentage change of GDP per capita of 5.3%. Yet in the 1990s, Chile has apparently experienced fast growth of exports based on natural resources (see Castañeda 1999:234). Thus, the situation of high GDP per capita *and* an increasing per capita ISEW is in contradiction with the authors' conclusions: that economic growth leads to environmental *un*sustainability. Unfortunately, the data on the Chilean ISEW does not extend beyond 1995 so it is difficult to ascertain if this is a transitory recuperation of net welfare.[105]

While the author has quite a good ecological-historical account, her

[105] Compared with other Latin American countries, Chile has better managed macroeconomic stability by counter-cyclical policy, and has been able to reduce both fiscal and overall GDP growth volatility since the 1990s with the help of existing or newly created stabilisation or savings funds (see Budnevich 2008). For commodity-dependent countries, stabilisation funds are *potentially* good institutions to protect future well-being (when the local currency depreciates against US dollars).

story of the various social problems encountered by the average Chilean was too inadequate (e.g. see Castañeda 1999:233). During the recessionary years of 1971–1973, the ability to find compromise solutions between left parties and the political right broke down, leading to a military coup. In 1973, the ousting of Salvador Allende led to a sharp reorientation of Chile's socioeconomic system. The subsequent leadership of General Augusto Pinochet and his successors championed a more free-market orientation. Under military rule (1973–1989), political repression and economic decline contributed to a substantially weakened trade union movement, income distribution became more unequal and poverty shot up (Edwards and Cox Edwards 1987:162). Hence, it is better to have a comparative analysis between the Chilean GDP and ISEW in the milieu of these times (1971 to 1989).

For the eighteen moribund years of Chile's socio-economic record between 1971 and 1989, the average annual growth of real GDP per capita was 0.99%, and the average annual percentage change of real ISEW per capita was –1.67%. During this period, privatisation in health care produced a two-tier system, involving a private system for the well-off and a public system for the remaining 85 percent of the population, but a sharp deterioration of public health services occurred as both government and upper-class financial contributions to health care dropped (see Teichman 2008:448-9). While the Chilean ISEW seems to accentuate the extent of these social problems better than GDP, a high rate of economic growth is *not* the cause for the decline in social and environmental well-being. A less than one percent growth rate of GDP per capita in 1971–1989 indicates a dysfunctional capitalist institutional arrangement. In this case, the long-run trends of GDP growth illustrate quite well the workings of the socioeconomic system, almost as well as but not quite as good as ISEW. It is inopportune that the author does not give any discussion of how the socio-political system has shaped the real historical trends of GDP and ISEW.

4.4.10 Polish ISEWs

Gil, Sebastian and Jerzy Sleszynski (2003) "An Index of Sustainable Economic Welfare for Poland", *Sustainable Development*, vol. 11, pp. 47-55.

Prochowicz, Robert and Jerzy Sleszynski (2006) *The Index of Sustainable Economic Welfare Revisited for Poland in Transition*, Revista Internacional de Sostenibilidad, Tecnología y Humanismo. Número 1. Año.

Gil and Sleszynski (2003) calculate a Polish ISEW for the years 1980 to 1997. This study is the first ISEW for Poland. The authors do not provide a theory or any substantial methodological improvements. Essentially, they adopt the methods similar to those utilised in other ISEW studies (see Gil and Sleszynski 2003:47-9). For instance, they follow Stockhammer *et al.* (1997) by applying the 'distribution of income inequality' to the whole index rather than to 'personal consumption expenditures'. Their empirical results of GDP per capita and ISEW over

the 1980–1997 period are shown in *Figure 4.13a* and *Table 4.13a* below:

Figure 4.13a. Polish ISEW and GDP, 1980–1997

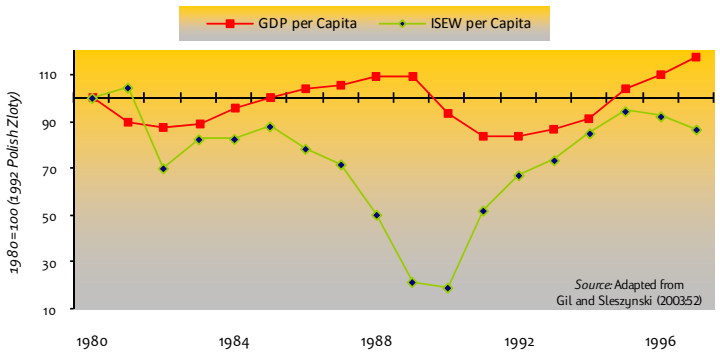
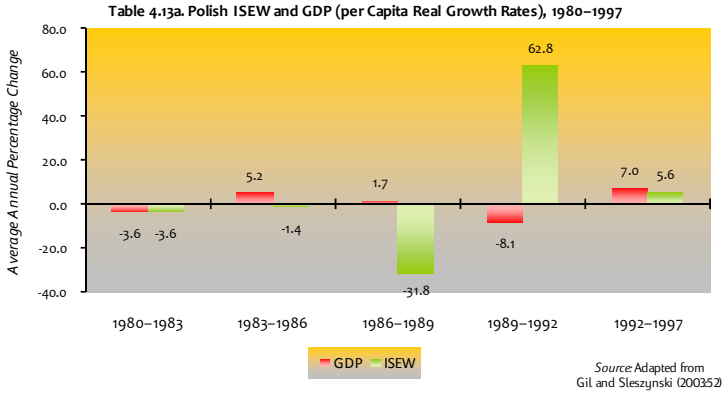


Table 4.13a. Polish ISEW and GDP (per Capita Real Growth Rates), 1980–1997



This is how the authors observe the above trends of the ISEW for Poland:

> It turns out that after some fluctuations in 1980–85, a decline of the index in 1985–90 is observed. The ISEW reached its lowest values in 1989–90. Up to 1995, we can observe a growth dynamic at the beginning and falling in succeeding years, which eventually shows a tendency back downward that started in 1996. [Gil and Sleszynski 2003:47]

They argue that the recent decrease of the Polish ISEW in 1996 and 1997 is explained by: (a) the increase in long-term environmental damage and ozone layer depletion; (b) losses caused by commuting and road accidents; and (c) growing welfare inequalities.

They note the transition phase that Polish society recently experienced. In their words,

> [t]he research covers the time period between 1980 and 1997. [T]his period was typified by a considerable variability

> of the conditions of economic development, which additionally complicates the analysis of the processes of growth or falls of welfare. [I]in fact, epochal and unique events took place: the crisis of the 1980s, *transition from a centrally planned economy to a free-market-based economy* [Gil and Sleszynski 2003:49, emphasis added]

However, unfortunately, their article lacks any real lively discussion of Poland's socioeconomic situation *vis-à-vis the ISEW*. The strikes and institutional instabilities of the 1980s followed by the transition to a market-based economy in the 1990s and their effect on the ISEW were poorly examined. Hence, it reduced the overall effectiveness of this aggregated-index of sustainable economic welfare.

Prochowicz and Sleszynski (2006) revisit the situation in Poland and (re)construct an ISEW for the 1990–2003 period. The 1990s and 2000s is an interesting period of study for Poland, as the country is now under a radically different system of relative free market capitalism. The authors note that any conclusions drawn over this period of study should be scrutinised in the context of the past events, e.g. the crises of the 1980s, and transformation of the system accompanied by a decrease in production of majority of enterprises on the turn of the 1980s and early 1990s. That is, the authors realise the importance of the political economy concept of *path dependency*: the trends that have been shaped by decisions or changes in the past have an influence on the efficacy of decisions and changes implemented in the present. Yet, "it is [difficult] to draw ... conclusions related to [the] ... before and after [periods of the] deep transitions of the system" (Prochowicz and Sleszynski 2006:79).

The trend results of Polish GDP per capita and ISEW for the 1990–2003 period are shown in *Figure 4.13b* and *Table 4.13b* on page 146. The average annual growth of the ISEW per capita over the 1990–2003 period was significantly higher (13.4%) than the growth rate of GDP per capita over the same period (4.1%), as indicated in *Table 4.13b* below. In relation to the "threshold hypothesis", the point where socioeconomic welfare diminishes contemporaneously during the expansion of economic growth, a significant question arises: Has capitalist development been good for the average citizen of Poland? Yes apparently, economic growth has been conducive to welfare, as sustainable economic welfare increased over the 1990s and early 2000s (albeit at a slower rate in the latter period). However, we are not too confident in making these assertions, because the analysis of the long-term trends in the stabilised market economy by Prochowicz and Sleszynski (2006) has been undersupplied.

Figure 4.13b. Polish GDP and ISEW, 1990–2003

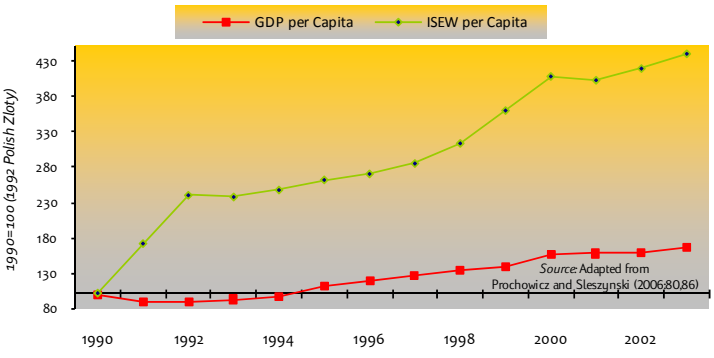
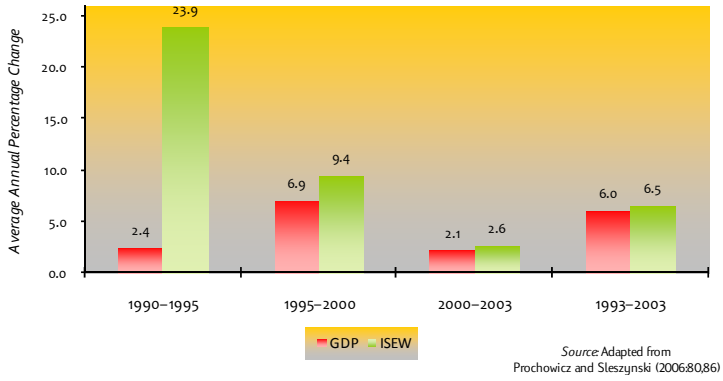


Table 4.13b. Polish GDP and ISEW (per Capita Real Growth Rates), 1990–2003



Despite the fact that the authors submit that a deeper analysis is needed (see Prochowicz and Sleszynski 2006:85), sadly, there is a deficient socio-historical account of the revised Polish ISEW. They are more interested in aggregating the variables to construct a single-number indicator of 'welfare–sustainability'. There is no attempt to place Poland in the wider regional system. The former USSR has been associated with a process of deindustrialisation since the 1980s. For instance, due to "transition augmented" fundamental uncertainty, the Central Asia and Eastern Europe area has experienced irregularity during 1997–2007 (massive slump, then large expansion of growth) (Podkaminer 2006:311, Sušjan and Redek 2008:228). This is another missed opportunity to shine a bright light on the ISEW, especially from a regional comparative perspective.

4.4.11 Thai ISEW

Clarke, Matthew and Sardar M. N. Islam (2004) *Economic Growth and Social Welfare: Operationalising Normative Social Choice Theory*, Amsterdam: North Holland Publishing.

Clarke, Matthew and Sardar M. N. Islam (2005a) "Diminishing and Negative Welfare Returns of Economic Growth: An Index of Sustainable Economic Welfare (ISEW) for Thailand", *Ecological Economics*, vol. 54, pp. 81-93.

Clarke, Matthew (2006) "Policy Implications of the Index of Sustainable Economic Welfare: Thailand as a Case Study", in Philip A. Lawn (Ed.), *Sustainable Development Indicators in Ecological Economics*, Cheltenham, UK: Edward Elgar, pp. 166-185.

Clarke and Islam (2004, 2005a) and Clarke (2006) provide an important

case study of the relationship between long-term economic growth and sustainable economic welfare for a newly industrialising country, Thailand. Thailand ranks as one of the world's most successful economies during the last quarter of the twentieth century. Sustained economic growth has played a major role in increasing the welfare of many Thais; reducing absolute poverty levels from nearly one third of the population in 1975 to less than 10% in 1999 (Warr 2001). However, Clarke and Islam (2005a) seek to attain a truer indication of the benefits and costs of the economic growth during that period by developing an ISEW for Thailand.

The authors contribute to the literature by establishing that the ISEW is theoretically based on a *social welfare function*. In short, the social welfare function involves the maximisation of the net benefits of economic growth—the benefits from the utility provided by goods and services minus the costs of the damages caused by growth.[106] An important methodological tool, which the authors utilise to construct the Thai ISEW, is cost-benefit analysis in company with social choice theory. For instance, a small number of adjustments are specific to the Thailand ISEW, such as for corruption, debt and commercial sex work. The decision to include these adjustments within the Thai ISEW is justified by accepting the principles of normative social choice theory.

Figure 4.14 and *Table 4.14* illustrate on page 148 their Thai GDP per capita and ISEW over a 25-year period, 1975–1999. In general, GDP per capita increased at a faster rate than ISEW per capita over 1975–1999. *Figure 4.14* shows that the trend line of GDP per capita steadily rose from 1975–1986 while ISEW rose and fell over the same period. ISEW per capita effectively remained unchanged from 1979–1986. The ISEW and GDP per capita increased progressively during the next decade (1986–1996), but at different growth rates (see *Table 4.14*). Both indices peak in 1996. This is just prior to the Asian financial crisis of 1997 and several years after. From 1996 to 1999, both indices declined: the average annual (negative) growth rates of ISEW per capita and GDP per capita were –6.2% and –3.8%, respectively. But, there was an apparent recovery in 1999 of GDP per capita. Even as GDP per capita has shown the propensity to increase in 1999, ISEW per capita has not increased but has fallen again. The authors realise that it is too early to confirm whether this is a trend or a fluctuation in the ISEW. However, they underplay the paralleling trends of ISEW *and* GDP per capita over the business cycle: on average, economic welfare (and growth) was 'sustainable' during the pre-crisis period and was 'unsustainable' in the post-crisis period. At the aggregate level, they are too absorbed in the "increasing gap" between GDP and ISEW.

[106] For a more detailed treatment of the social welfare function, see *Chapter 3*.

Figure 4.14. Thai GDP and ISEW, 1975–1999

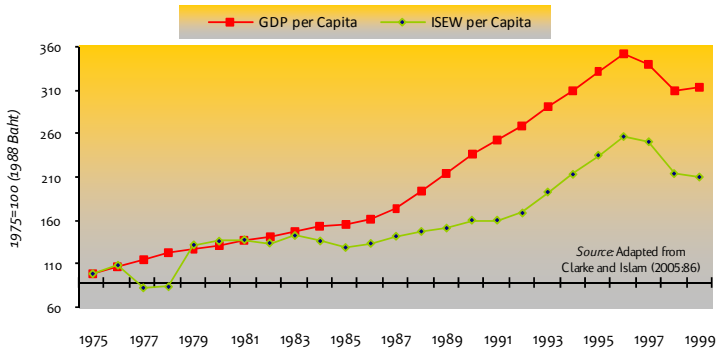
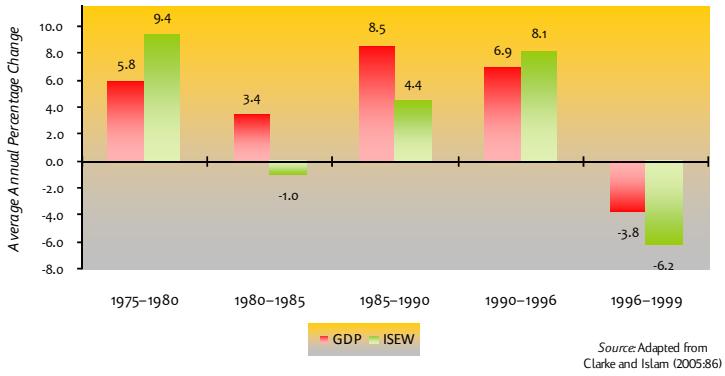


Table 4.14. Thai GDP and ISEW (per Capita Real Growth Rates), 1975–1999



On the other hand, when comparing the two indices an increasing divergence is apparent. This may mean that the costs of achieving economic growth begin to outweigh the associated benefits. According to the authors, this indicates that the relationship between GDP and ISEW is becoming increasingly weaker throughout the time series, casting doubts over the long-term desirability of economic growth in Thailand in terms of welfare. The GDP per capita index maintains its three phases of growth (constant, accelerated and crisis), whilst the ISEW per capita index rises and falls through to the earlier 1990s, then has a steady period of growth before falling again following the financial crisis in 1997. The most significant adjustment in this ISEW was the cost of inequality to welfare. This was eight times more important than the estimated costs of commercial sex work. The largest positive adjustment within the ISEW was education. However, as argued in *Chapter 3*, Clarke and Islam completely neglect the contributions of household labour in this, their first Thai ISEW. With the inclusion of this variable, the divergence between the Thai ISEW and GDP (per capita) *could* be vastly different to the results gained.[107] This leads to the general problem of leaving out a critical variable in the index.

[107] To confirm whether this is a problem or not, a further investigation is warranted into Clarke and Shaw's (2008) updated Thai GPI study, since they have now included a monetary estimate for the benefits of household labour.

4.4.12 Dutch ISEW (2)

Bleys, Brent (2007a) *A Simplified Index of Sustainable Economic Welfare for the Netherlands, 1971–2004*, Brussels, Belgium: Vrije Universiteit Brussel.

Bleys, Brent (2007b) "Simplifying the Index of Sustainable Economic Welfare: Methodology, Data Sources and A Case Study for The Netherlands", *International Journal of Environment, Workplace and Employment*, vol. 3 (2), pp. 103-118.

This is the second ISEW study for the Netherlands. Bleys (2007a, 2007b) constructs several versions of the ISEW; for instance, he generates a so-called Simplified Index of Sustainable Economic Welfare (SISEW) for the Dutch economy over 1971–2004. A SISEW could prove useful to overcome some of the methodological issues raised in the literature. The SISEW comprises fewer items than the usual ISEW, that is, at a minimum, five ISEW items are not included in his "SISEW1": namely, costs of personal pollution control; car accidents; noise pollution; adjustments for consumer durables; and loss of farmlands (see Bleys 2007a:4). Bleys (2007a:33, 2007b:105) argues that these variables can be excluded to construct the SISEW because of their "low quantitative significances". Following Lawn (2003), Bleys (2007a) simply accepts that the ISEW is soundly based on the income concept of Fisher. Reminiscent of all other ISEW studies, he does not go to the theoretical roots of Daly and Cobb's (1989) person-in-community model.

The results of the Dutch GDP per capita and SISEW over the 1971–2004 period are shown in *Figure 4.15* and *Table 4.15* below:

Figure 4.15. Dutch GDP and SISEW, 1971–2004

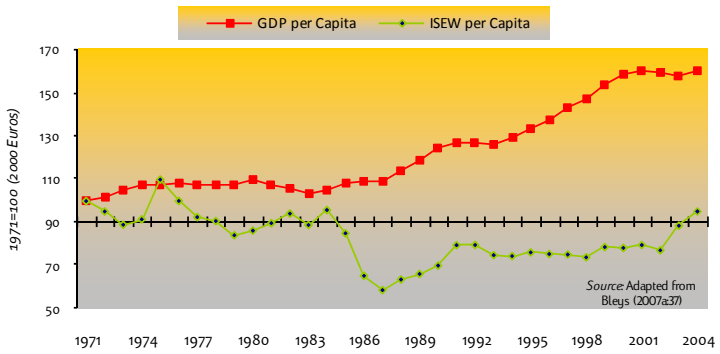
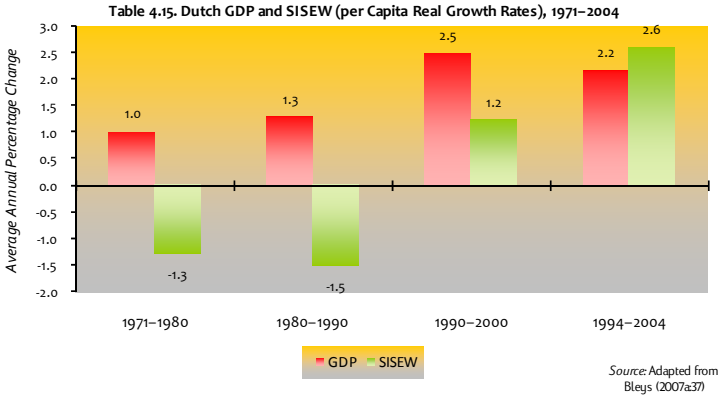


Table 4.15. Dutch GDP and SISEW (per Capita Real Growth Rates), 1971–2004



In the 1970s and 1980s, SISEW per capita declined (on average), whereas growth in GDP per capita was positive but moderate over the same period. Dutch GDP per capita grew much stronger in the 1990s yet slows a little in the early 2000s. SISEW per capita grew moderately in the 1990s and finished much stronger in the early 2000s. The most obvious conclusion is that the gap between GDP and SISEW significantly widens since the mid-1980s. But note that the 2004 level of sustainable economic welfare per capita is almost the same as the 1971 level (see *Figure 4.15*)—effectively his SISEW suggests that zero progress was made over the thirty-three-year study period. Unfortunately, there is not a lot else that can be said about these figures, as Bleys (2007a, 2007b) does not provide any historical specificity of the Netherlands' economy. He describes the trend of the per capita SISEW (and GDP) in abstract terms: there is neither much reference to the institutional arrangement nor is there any business cycles analysis. This is a disappointing end to the ISEW national studies.

4.4.13 Summary of the National ISEW Studies

In all of the national-level ISEW studies, there is *no* conceptual support given to the empirical and historical applications of Daly and Cobb's (1989) "economics for community" theory. Eleven out of thirteen empirical studies have not theoretically advanced the ISEW since Daly and Cobb (1989). That is, only two studies have contributed to the ISEW's theoretical foundations—the authors of the Austrian (Stockhammer *et al.* 1997) and Thai ISEWs (e.g. Clarke and Islam 2004). Indeed, the authors of the Austrian ISEW study are the lone authors identifying the limitations of the ISEW in the context of capitalism.

Some studies have provided a reasonably good socio-historical analysis, such as the US (e.g. Cobb 1989), German (Diefenbacher 1994), Swedish (Jackson and Stymne 1996) and Austrian ISEWs. However, most authors do not scrutinise the long-term trend of the ISEW vis-à-vis the expansionary period of economic growth (GDP growth) during historically interesting epochs (e.g. the 1950s and 1960s). A large number of studies provide no construal of the downturn of the business cycle *and* the degradation of social and environmental development. An injudicious application of the real socioeconomic processes of capitalism is the natural outcome when there is too much focus on 'the gap' between GDP and the ISEW, such as in the Dutch ISEWs by Rosenberg *et al.* (1995) and Bleys (2007a, 2007b).

Moreover, several studies lack any real lively discussion of the socioeconomic situation *vis-à-vis the ISEW*—i.e. the authors of the Scottish (Moffatt and Wilson 1994), Italian (Guenno and Tiezzi 1998), Chilean and Polish (Gil and Sleszynski, 2003; Prochowicz and Sleszynski, 2006) ISEWs. These advocates are more interested in aggregating the

benefit/cost variables to construct the single-number indicator of welfare–sustainability. They describe the trend of the per capita ISEW (*and* GDP) in a very mechanical way: there is no reference to the institutional arrangement nor is there any business cycles analysis. Let us hope that the empirical applications of the national-level Genuine Progress Indicators (GPIs) improve on the ISEWs, which will be discussed in *Section 4.5* below:

4.5 The Genuine Progress Indicator (GPI)

Commonsensical Accounting

According to authors at *Redefining Progress*, the defects of GDP as a measure of progress are egregious and many. For one thing, it includes only a portion of economic activity, the part that involves an exchange of money. Consequently, it leaves out the things that people value and fundamentally need, such as the unpaid work in households, caring for children and the elderly, and the hours of free time for family or community activities. GDP also excludes the critical contributions of the natural habitat, such as pure air and water, fertile soil, moderate climate, and protection from the sun's harmful rays—even though these services, which the Earth provides freely, become expensive if they need to be bought instead (e.g. see Cobb *et al.* 1999:1-2).

> [GDP] ... completely ignores the non-monetary contributions of families, communities and the natural environment. ... [T]he GDP masks the breakdown of the *social structure and natural habitat*; and worse, it portrays this breakdown as economic gain ... and the nation's massive borrowing from future generations. [Cobb *et al.* 1995:1,44, emphasis added]

Thus, the critical factors of genuine progress are a functioning ecology *and* society, i.e. the authors of the Genuine Progress Indicator (GPI) emphasise the social and natural aspects of life. The inclusion of both environmental *and* social dimensions is a more promising start than the US ISEW.

For example, the authors of the US GPI note the following social and environmental problems with GDP: a) GDP treats crime, divorce, legal fees, and other elements of social breakdown as economic gains. For instance, the Enron scandal alone may well of contributed up to one billion dollars to the US economy, e.g. all the court cases, lawyer's fees, housing criminals, media frenzy, and payouts continue to be counted as positive gains by the accounting standards of GDP (see Cobb *et al.* 1999:7). These are "non-productive contributions" (Venetoulis and Cobb

2004:7). b) GDP increases with polluting activities and then again with clean-ups; c) car wrecks, medical costs, locks and security systems, and insurance are also pluses to GDP; d) GDP ignores the liabilities of living on foreign assets; e) GDP takes no account of income distribution; and f) GDP takes no account of the depletion or degradation of natural resources. In summary, GDP treats every transaction as positive, as long as money changes hands—the "GDP counts such costs as economic gain; even as the social structure erodes, we say 'the economy is improving' ... thus ... [i]t assigns to social and ecological capital an implicit and arbitrary value of zero" (Cobb *et al*. 1995:7-8).

They argue that a truer indicator of progress, in contrast to the above shortcomings of GDP, would offer a statement of *net benefit*. For instance, in the case of a car, it would evaluate the *services* the car provides against the associated downsides: the pollution, the increased congestion and accidents, road maintenance and police services, and insurance rates. In the words of Cobb *et al*. (1999:10-1), "GDP operates like a business income statement that adds expense to income instead of subtracting them. ... A single index [is thus viable] so that gains in one area could be offset by losses in another, and vice versa". Hence, *a priori*:

> The Genuine Progress Indicator (GPI) takes from the GDP the financial transactions that are relevant to well-being. It then adjusts them for aspects of the economy that the GDP ignores. The GPI thus reveals the relationship between factors conventionally defined as purely economic and those traditionally defined as purely social and environmental. ... But the GPI assesses the well-being of households, rather than focusing exclusively on the number of dollars they spend. [Cobb *et al*. 1999:3]

Therefore, it is argued that by *commonsensical accounting* and pragmatic example, the authors provide a 'theory'—an idea accounting for or justifying something (Soanes and Stevenson 2004)—to modify GDP to include the values of both market and non-market activity within a single, comprehensive framework (via a long-term perspective):

> [GDP] makes no attempt to approximate a net benefit. ... [But] ... [t]he GPI is much closer to the *common-sense accounting* that a household would do. A family would not add together its income and expenses to assess its financial condition; nor would it lump together every kind of expense to determine if it were doing better or worse. For example, college tuition and the cost of a new burglar alarm system would appear very differently: one a way of

> getting ahead, the other a necessary defence against falling behind. [Cobb *et al.* 1995:9, emphasis added]

For instance, Cobb *et al.* (1995) sketch their 'theory', or more correctly their sensible bookkeeping procedure, as follows: Similar to GDP, GPI examines 'final' purchases only. As, business expenses are intermediate costs (yet not necessarily true societal costs), and therefore show up ultimately in the price of products and services sold to consumers. In addition, the GPI authors at *Redefining Progress* have subtracted only household spending on crime prevention as well as the direct costs of crime to households. And they have excluded government expenditure in the GPI, e.g. city police, because their baseline, personal consumption, does not include government spending. In summary, the GPI adds the *final* value of services and products consumed in the economy (in a analogous manner to GDP), but they also add non-market activities not found in GDP. Then the GPI subtracts three categories of expense related to that consumption: 1) defensive expenditures (ambiguous and regretted consumption that compensate for past costs); 2) social costs/disservices to current well-being; and 3) the depreciation of environmental assets and natural resources.

The US GPI (Cobb *et al.* 1995) is the first attempt in the history of sustainable economic welfare construction to account for well-being dimensions that are more "social". As a result, the US GPI is a real attempt to incorporate social dimensions, which is in line with what Daly and Cobb (1989, 1994) wanted to convey in their original ISEW measure, an "*economics for community*"—albeit the GPI authors do not explain this. The GPI accounts for social cost and social cohesion in the following three respects:

'Social capital' and the Value of Volunteer Work

The authors observe that the role of families has been more and more dislodged by television, shopping malls, fast food restaurants and other aspects of the market. In an affluent society, as life functions such as meal preparation and personal counselling are increasingly provided through monetised commerce rather than though extended families, family bonds begin to fray for lack of the life activities that strengthen them. "The most basic and important "service sector" in America is the family" (Cobb *et al.* 1995:19). They note that children living with a single parent or with a stepparent are more likely to face socioeconomic hardship than children living with biological parents. Hence, the GPI is a more advanced version of the ISEW because it accounts for *social* dimensions of well-being affecting the society.

However, there are some measurement hurdles to overcome:

> Ideally, we would compute how the rising "service" and "entertainment" sectors have helped displace—and deplete—the stock of "social capital", similar to the way we estimate the capital depreciation and depletion of natural resources. But there is virtually no data on the "service" parents and other adults provide children in the process of growing up (not to mention the problems of trying to quantify such relationships in the first place). [Cobb *et al.* 1995:19]

The authors therefore were forced (in their words) to adopt proxies that provide only indirect measures. Two such proxies they utilise are: 1) divorce and its effects on children; and 2) the amount of time families spend watching television.

But, the authors are not purely interested in the economic costs to society; they are also concerned with (some of) the benefits. According to the authors, *volunteer work* is the nation's 'informal safety net', the invisible social matrix on which a healthy market economy depends. A nation's informal safety net, i.e. volunteer labour is *perhaps* a good proxy for social capital.

Costs of Crime

The authors calculate the costs of crime: "[c]rime exacts a large economic toll on society. Some of these costs are obvious, such as medical expenses and lost property. But others are more elusive, because they are psychological (the trauma of being violated) or are incurred in the form of lost opportunities, such as activities foregone because people fear the possibility of theft or violence" (Anielski and Cobb 1999:12). The GPI utilises the cost of crime to victims based on their out-of-pocket expenditures or the value of stolen property, while other direct costs are defensive expenditures to prevent or avoid the impacts of crime, such as locks, burglar alarms, security devices, and security services. Thus, the "costs of crime" item is only a partial measure of *a*social capital.

Underemployment

Underemployment is the long-term rise in the proportion of the labour force that would like to work more but cannot obtain that work. The authors note that the social consequences of long-term unemployment are high, albeit much of the financial hardship is covered by unemployment insurance. However, the relative *social distress* (Cobb *et al.* 1995:23) caused by long-term structural changes is dangerously exorbitant, e.g. suicides, assaults, and admissions to mental hospitals. Nonetheless, the authors do not measure these secondary costs of underemployment, but measure them directly via the hours of

underemployment as a cost.

4.5.1 The US GPIs

Cobb, Clifford W., Ted Halstead and Jonathan Rowe (1995) "The Genuine Progress Indicator. Summary of Data and Methodology", *Redefining Progress* (September).

Anielski, Mark and Jonathan Rowe (1999) "The Genuine Progress Indicator – 1998 Update", *Redefining Progress* (March).

Cobb, Clifford W., Gary Sue Goodman and Mathis Wackernagel (1999) "Why Bigger Isn't Better – The GPI 1999 Update", *Redefining Progress* (November).

Cobb, Clifford W., Gary Sue Goodman and Joanne C. May Kliejunas (2000) *Blazing Sun Overhead and Clouds on the Horizon. The Genuine Progress Report for 1999*, Oakland, California: Redefining Progress.

Cobb, Clifford W., Mark Glickman and Craig Cheslog (2001) *The Genuine Progress Indicator 2000 Update* Redefining Progress Issue Brief.

Venetoulis, Jason and Clifford W. Cobb (2004) The Genuine Progress Indicator 1950–2002 (2004 Update), Redefining Progress: Sustainability Indicators Program, March 2004.

Talberth, John and Alok Bohara (2006) "Economic Openness and Green GDP", *Ecological Economics*, vol. 58, pp. 743-758.

Talberth, John, Clifford W. Cobb and Noah Slattery (2007) *The Genuine Progress Indicator 2006 – A Tool for Sustainable Development*, Oakland, California: Redefining Progress.

Now we will examine the empirical results of the US GPIs in a chronological fashion. Since GDP measures output and GPI measures economic health or national well-being, the two trend lines do not purport to portray the same things. Thus, the absolute size of the indicators is not particularly relevant for comparative purposes (see Cobb *et al.* 1995:43). The best approach is to interpret the shapes and curves of the growth *trends* of the GDP and GPI. Cobb *et al.* (1995) constructed the first GPI study for the US over the 1950–1994 period. This GPI was calculated in 1982 constant dollars using the consumer price index and GDP implicit price deflator. In comparison to the growth in GDP per capita, the growth trend of ISEW per capita suggests that the 1950s and 1960s was a relatively more welfare enhancing period than the 1970s, 1980s and early 1990s (average annual rates of change were negative), as shown in *Figure 4.16a* and *Table 4.16a* on page 156. In *Table 4.16a* below, the growth rates of GDP per capita were slightly higher in the 1950s and 1960s (when the GPI per capita was growing) than in the 1970s, 1980s and early 1990s (when GPI per capita was declining). The authors provide some good details vis-à-vis the reduction in the rate of progress since the 1970s, yet the authors do not offer a strong socio-historical narrative. But, the focus was on establishing the 'theoretical' foundation (i.e. commonsensical bookkeeping procedure) of the GPI, therefore their lack of historical specificity is forgivable.

The second major US GPI study at *Redefining Progress* is by Anielski and Rowe (1999). There are only a few differences between this GPI and the original index by Cobb *et al.* (1995). Chiefly, Anielski and Rowe (1999) updated the GPI methodology. Firstly, they expressed all values in constant (inflation-adjusted) chained 1992 US dollars. Secondly, they changed the way the income distribution index was calculated.

Figure 4.16a. US GDP and GPI, 1950–1994

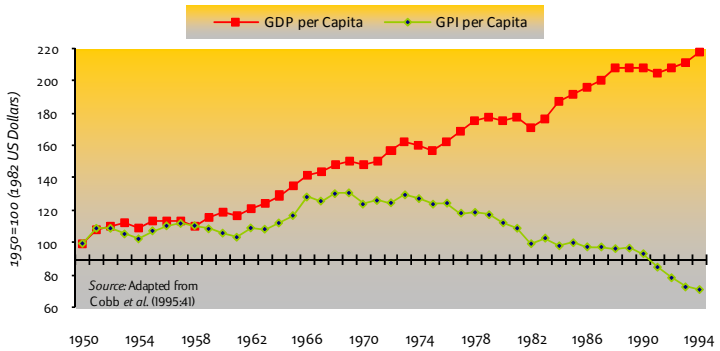
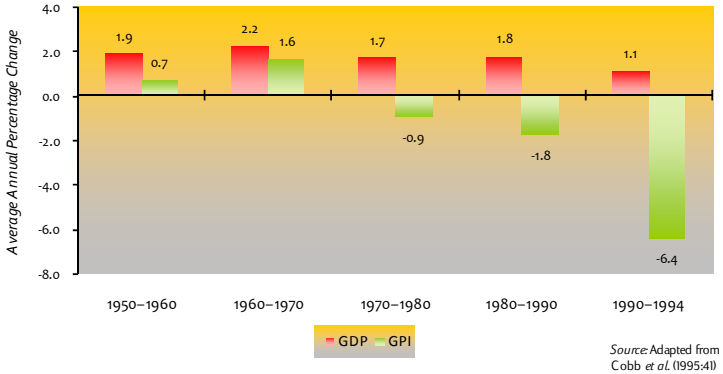


Table 4.16a. US GDP and GPI (per Capita Real Growth Rates), 1950–1994



The authors utilised the Gini coefficient, which measures relative income inequality across all income groups or quintiles.[108] And all parameters were updated for the years 1995, 1996, 1997, and 1998 (Cobb *et al.* 1999), including new physical and qualitative data and new value (cost or benefit) estimates. The implication of the revised methodology did not significantly change the overall picture of the US economy. The growth rates of GPI per capita were much higher in the 1950s and 1960s than in the 1970s–1990s, whereas, on average, GDP per capita increased over the 1950–1998 period, as shown in *Figure 4.16b* and *Table 4.16b* on page 157. The authors argue that the gains from growth in GDP have proceeded increasingly to the highest income earners in America, leaving the poor further behind. From 1975 to 1998, the proportion of total income received by the poorest fifth of the population dropped from 4.4% to 3.6%, while the proportion received by the richest fifth increased from 43.2% to 49.2%—hence, a major reason for the declining US GPI since 1975 (see Cobb *et al.* 1999). The authors claim, "[p]art of this widening gap between rich and poor in the 1990s derived from the tremendous surge in the value of equities" (Cobb *et al.* 1999:10).

[108] The original GPI used a customised index reflecting the change in the share of national income received by the poorest 20 percent of households.

Figure 4.16b. US GDP and GPI, 1950–1998

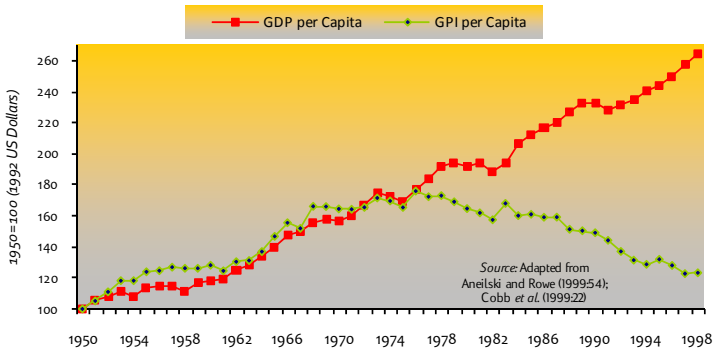
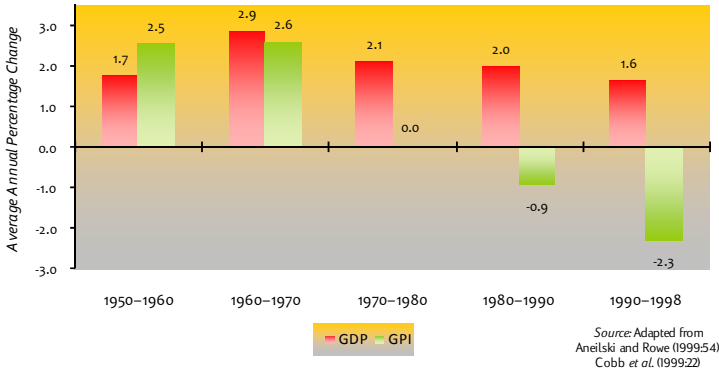


Table 4.16b. US GDP and GPI (per Capita Real Growth Rates), 1950–1998



Thus, Cobb *et al*. (1999) are the first in the net income literature assess the *contradictory role between industry and finance* within the GPI—a significant theme of political economy.

Finance is an 'investment' to the extent that it promotes real industrial activity by providing information, liquidity and spreading risk. Finance is 'consumption' to the extent that it erodes real wealth and promotes systemic instability. Historically in the US, finance played a somewhat volatile *yet restrained role* during the 1950s and 1960s. But in 1970–2008, finance is an ever-more powerful *yet highly volatile force*. The weight, influence of "oligopoly–finance capital" (à la Amin 2008:52) and the obsessive pecuniary motives by multifarious actors are socially damaging. The declining trend of the US real GPI per capita since the mid-1970s to 1998 seems to reflect a dominance of finance over industry. Latterly, of course, high-risk sub-prime mortgages in the US and Europe have become a source of historic instability. It will be very interesting to see how other SEWI advocates tackle the industry–finance contradiction in their analyses. In any case, Cobb *et al.* (1999) must be commended on first seeing (in the SEWI literature) the criticality of this issue.

In addition, the remarkable foreign ownership of American assets has led to a severe trade imbalance between the US and the rest of the world. Hence, foreign capital flowing into the US in 1997 and 1998 contributed

greatly to the dramatic stock market rise (leading to a speculative bubble). But as the authors say, this growth in paper value from foreign investment does not represent enduring economic strength. It means that foreign ownership of US assets grew rapidly compared to assets held by Americans overseas. When these foreign owners are finally paid off (with interest and dividends), the investment funds will flow out of the United States. Relying on foreign investors to inflate the US stock market is equivalent to borrowing now to pay for increased consumption and forcing future generations to pay the interest, according to the authors:

> While we have essentially financed our economic growth by borrowing overseas, the rise in paper wealth created an illusory sense of prosperity, which in turn fostered increased consumption, particularly by the wealthiest households. But this process is unsustainable. While we have added to future generations' debt burden by failing to reinvest in business and borrowing from foreign countries, increased consumption has also depleted the legacy of natural assets that will be inherited by our children. [Cobb *et al.* 1999:11]

Thus, Cobb *et al.* (1999) provide a *very good* but not excellent historico-institutional analysis, which supplements the work on the GPI by Anielski and Rowe (1999), as discussed below:

Generally, the authors argue that the following GPI components indicate improvements in the quality of daily *social* life for many Americans during the 1990s: less underemployment, divorce, household costs of crime, and more time devoted to household and volunteer work imply greater wellbeing and stronger social cohesion.[109] However, there are several problems with their analysis. During the 1980s, the GPI showed a relatively consistent rate of growth of 0.5% per year in the 'costs of family breakdown', but since 1994 these costs have stabilised. But, the choice of 'divorce rate per population' adopted by *Redefining Progress* in their US GPI is fallible. The correct method to utilise is 'divorce rate per married couple'. In other words, social cohesion in the US has probably deteriorated more than the authors had estimated, which would have provided *extra* support for the 'threshold hypothesis'.[110] Nonetheless, there is a real attempt to describe the *quality* of the stock of social capital at *Redefining Progress*.

[109] According to the authors, social life was enhancing even with leisure hours proportionally declining in the 1970s to 1990s.

[110] Direct costs to the adults involved measured by the 'divorce rate per population' underestimates the true situation. However, Anielski and Rowe (1999:15) acknowledge the limitations of using these proxies for social dimensions, and state that it "grossly underestimates the true cost to the nation from the erosion of social capital resulting from family breakdown".

However, there are limits to which the GPI can tell a good story about the real relationships of persons-in-community. Consider the following relatively good inter-group analysis by Cobb *et al.* (1999). The justification for deducting half of the "private expenditures on health" component of the GPI as 'defensive' is quite valid: e.g. excess weight, Type II diabetes, obesity-related heart disease, cancer, stroke, and hypertension all contribute to GDP by payment to medical practitioners (medical costs). Extensive evidence supports that risks for high cholesterol, clogged arteries, and heart disease *begin in childhood*, with poor diets (i.e. consumption habits) and sedentary lifestyles. The US GPI authors (see Cobb *et al.* 1999:24-40), for instance, provide real estimates of medical spending on disease associated with obesity. They illustrate the real problem of GDP across the general population and amongst social groups. For example, the authors provide data demonstrating the illogicality of counting all growth in consumption as progress. They note that the food industry illustrates the differences between consumption that adds and detracts from genuine quality of life and demonstrates the self-replicating, self-expanding nature of economic growth. In short, many Americans are habituated to buying solutions to problems, so they prefer diet drinks disguised as pop or milkshakes and even surgery to altering their unhealthy eating habits and sedentary lifestyles (see Cobb *et al.* 1999:28).

In addition, "Consuming Kids" in Cobb *et al.* (1999) further highlights the need to distinguish between different types of consumption, with different effects on consumers' physical, mental, and psychological health. Thus, they specifically scrutinise the health of *children*. Their study demonstrates how children (as heterogeneous agents) are being habitually socialised, i.e. via fashion and obsolescence, into the idea that consumption is the route to happiness as well as the index of progress. Meanwhile, advertising creates a continuous flow of consumers to perpetuate the pattern of empty economic growth (see Cobb *et al.* 1999:31). Advertising persuades unsophisticated consumers to acquire products that damage their physical health; the 'ads' themselves erode kids' self-esteem or self-worth.[111] An increase in spending on clothing by children also reflects the need to look stylish, keep up with trends, and try to purchase a sense of belonging and acceptance:

> If we were attending to genuine progress, as does the GPI, overeating, then dieting, then treating eating disorders and

[111] "The advertisers catch children in a vicious cycle, encouraging them to eat foods and live lifestyles that induce weight gain, while teaching them to see thin as attractive and fat as repulsive, by using stereotypically thin women and super-fit muscular men in advertising and shows. The more a child's self-confidence declines, the more vulnerable he or she may be to messages linking consumption and happiness. ... There is also evidence that children increasingly measure self-worth by the products they own" (Cobb *et al.* 1999:36-7).

> surgically removing excess fat would be considered a net loss for our psyches, our perceptions of ourselves, and our well-being. The physical and mental health costs of our dysfunctional relationship with food should not be included in any true measure of progress. [Cobb *et al.* 1999:29]

In fact, children's spending has been rising since the 1960s. This increased personal consumption, according to conventional economic measures such as the GDP, is equated with progress. However, are kids progressing? Are they better off? Statistics concerning their physical and mental health, their eating, smoking, and drinking habits, their mounting debts, and their suicide rates indicate that they are not (see Cobb *et al.* 1999:33). Therefore, the authors ask a vital question,

> Have American youth achieved progress in the last decade? Their spending patterns say yes. The GDP and the economy say yes. Common sense, however, says no. Increased disposable income may be an economic benefit, but children's spending patterns—on more junk food, more cigarettes, liquor, and drugs—and their rising physical and mental health problems should be counted as social costs, and should depress a measure of progress. [Cobb *et al.* 1999:40]

Cobb's *et al.* (1999) socio-institutional analysis in "Consuming Kids" is laudable, stressing the problems faced by the modern youth of America and the damage to their net psychic income.

However, the authors have not excluded any of these items from the 'personal consumption expenditure' column in their US GPI. While the authors do account for the obesity epidemic, it is done in an indirect manner, by utilising the simplifying assumption of excluding half of the health expenditures as defensive expenditures. But, perhaps more importantly, while the authors report on various heterogeneous agents and their role in the socio-economy, e.g. *children* on drugs, heavy drinking, smoking and mood-altering substances (see Cobb *et al.* 1999:36), their GPI does not break down the allotment in which heterogeneous people (in this case, the children) are affected. (In addition, the GPI authors have noted the problems of advertising and fashion yet have not included an estimate for them in the GPI.) The GPI authors have raised valid critiques against GDP, but how does one judge the claims above, professed under "Column A, personal consumption expenditures" (Anielski and Rowe 1999:1-3), in the overall index? The authors do not specifically address the issue. Perhaps their critical

analysis inadvertently reveals the limitations of the 'personal consumption expenditure' component in the SEWIs?[112] In other words, pivotal limits of monetary-composite indices concerning the heterogeneity character of persons-in-community have been self-exposed.

Cobb *et al.* (2000) and Cobb *et al.* (2001) at *Redefining Progress* also recognise that the quality of the natural environment and social relationships are interrelated with economic well-being. Cobb *et al.* (2000) are primarily interested in the changes in GPI from 1998 to 1999, whereas Cobb *et al.* (2001) examine the GPI over the 1999–2000 and 1994–2000 periods. Only in passing do these studies examine the long-term trends of GDP and GPI for the US. Briefly, we will consider each study in turn.

In the Cobb *et al.* (2000) study, GPI per capita grew by 5.5 percent from 1998 to 1999, which is double the rate of real GDP per capita for the same period. This atypical rise in the GPI represents the highest percentage growth since 1976, surpassing even the years of economic recovery in 1983 and 1995. The authors have supplemented their results of the 1999 GPI with a high-quality analysis of real institutional processes. They argue that the GPI rose chiefly because of euphoria in the stock market and the massive splurge of household consumption expenditures. For instance, they converse on Hirsh's (1976) "positional goods"—that some forms of consumption are driven by the 'status contest', which depends on the subjective sense of position relative to those above on the status ladder. The pursuit of "positional goods", such as homes in exclusive neighbourhoods, luxury cars, and designer clothes, is by definition a contest that many must lose for a few to win, because the value of positional goods depends largely on unequal access. "In the interests of improving position (in reality or perception), luxuries become "needs" and impose demands for income to purchase them. ... Credit cards hold out the promise of staying in the running while escaping the immediate experience of deprivation, inadequacy, or losing ground" (Cobb *et al.* 2000:9). These factors overshadowed less dramatic, but persistent, signs of increased stress on social life and environmental health (see Cobb *et al.* 2000:3).

This last point regarding the declines in social and environmental well-being raises a corollary for the *aggregated* net income index. Essentially, the authors go to considerable effort to say that although the GPI shows signs of progress in social life, other significant indicators, such as real wages and personal debt levels, imply that the "huge growth of consumption came at considerable cost to their time for anything other than work" (Cobb *et al.* 2000:6). But, their analysis shows the

[112] On the other hand, the authors of the Victorian and Australian GPI go to further lengths and include deductions for some of the above non-welfare enhancing items, but do not scrutinise the political economy of heterogeneous agents.

limitations of constructing a (restricted) all-in-one indicator of sustainable economic welfare, because the GPI leaves out these critical variables. That is, the GPI cannot detect the surreptitious changes of real socioeconomic progress. They had to spend a lot of time suggesting that the raison d'être of the rise in the US Genuine Progress Indicator is not actual improvement after all. Their detailed *disaggregated* account—which is rather brilliant—in effect shows the major inadequacy of GPI in measuring "genuine progress".

Yet in their defence, the advocates recognise that year-to-year fluctuations of a single value could distort understanding of long-term progressions. For example, the GPI per capita rose by only 1.6% in 2000 over its 1999 level (see Cobb *et al.* 2001); a noticeable fall in the rate of growth which shows that the 1998–1999 period was not sustainable. Realising these limitations, Cobb *et al.* (2001) scrutinise the GPI over six years, 1994–2000. They provide the main reasons for why GPI per capita grew at a rate of 3.3% per year over the booming 1994–2000, which contrasted to the preceding 20-year period of stagnation (1974–1994). With reference to *the GPI*, we simply conclude that the authors know how to appraise socioeconomic and environmental progress or regress because of their reasonably good socio-historical account.

However, the authors do not examine the role that *economic growth* played in enhancing (if at all) the GPI over the speculative bubble period (1994–2000). Nor do they attempt to explain the link between a relatively low GDP over the mid-1970s and mid-1990s and the worsening GPI over the same period. Effectively, the authors' empirical applications have delinked *the GDP*—but not necessarily the GPI—from the capitalist system. As we argued in *Chapter 2*, cyclical trends of GDP growth can aid our understanding of the anomalies of capitalism. But these US GPI advocates ignore the real processes behind GDP growth (or lack thereof) that explain the pattern of capitalist development. The root of the problem is in their preferred bookkeeping technique. The GPI is based on good commonsensical accountancy whereas GDP, allegedly, lacks commonsense altogether:

> The GPI factors in hidden environmental [and social] costs ... [because] [t]he GDP fails to distinguish between monetary transactions that genuinely add to well-being and those that diminish it or merely seek to maintain the status quo. It makes no adjustment for economic activities that simply try to make up for degraded conditions. ... *[T]he GDP violates both basic accounting principles and common sense*. [Cobb *et al.* 2000:1, Cobb *et al.* 2001:2, emphasis added]

True, the authors are spot on vis-à-vis the limitations of GDP as a good measure of net welfare. The 'commonsensical' foundation of GDP might be more valuable than that proposed by the advocates of GPI, because GDP growth and decline are a suitable measure for understanding the dynamics of capitalism (discussed in *Section 4.11* below).

Another update of the US GPI at *Refining Progress* is by Venetoulis and Cobb (2004). It appears that this paper also supports the threshold tendency. There are no apparent methodological changes (in the Venetoulis and Cobb 2004 study) other than an update of the time-series; it is merely an extension of the study's time period examined (i.e. from 1950–1998 to 1950–2002). Their results of the US GDP per capita and GPI over the 1950–2002 period are shown in *Figure 4.16c* and *Table 4.16c* below:

Figure 4.16c. US GDP and GPI, 1950–2002

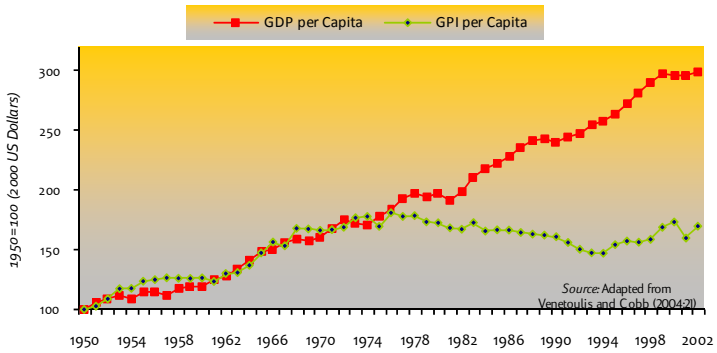
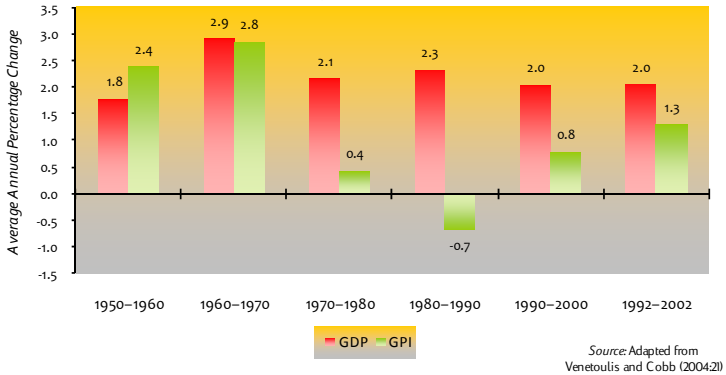


Table 4.16c. US GDP and GPI (per Capita Real Growth Rates), 1950–2002



Their empirical results are congruous with the previous studies. In the 1950s and 1960s, the US GPI was on a 'sustainable path', i.e. there was no gap between GDP and GPI. Progress since the 1970s to early 1990s has significantly declined. GPI rose during the mid-to-late-1990s but dipped a little after the stock market crash in the early 2000s. Overall, this rather brief study by Venetoulis and Cobb 2004 adds no entrancing

contributions to the existing literature on ISEW/GPI.[113]

Talberth *et al.* (2007) reconstruct the GPI for the US economy by attempting to measure collective welfare in terms of principles of sustainable development drawn from the economic, social, and environmental domains. They are the first authors to significantly update the methodology at *Refining Progress* since 1998, and incorporate numerous new studies and sources of information that have evolved since that time. By updating the "calculation approach", the US GPI is derived from 26 separate time-series data columns spanning the 1950–2004 period. All their figures are reported in year 2000 US dollars.

The authors constructively ridicule GDP from all angles, citing numerous examples of its erroneous assessment of real changes in well-being. GDP is oblivious to gross inequality, e.g. GDP growth thrives on the conspicuous consumption habits of the wealthy. GDP (*may*) plummet when communities become more self-reliant and try to enhance social cohesion at the local level. Because the authors begin with GDP, the US GPI is still based on a commonsensical operational procedure: "green GDP accounting systems all involve three basic steps" (see Talberth *et al.* 2007:3). That is, the GPI corrects for the deficiencies of GDP by incorporating aspects of the non-market economy, separating welfare-enhancing benefits from welfare-detracting costs, correcting for the unequal distribution of income, and distinguishing between sustainable and unsustainable forms of consumption. In their words, "[we] first isolate personal consumption expenditures by removing money spent purchasing, maintaining, or replacing durable goods and then make a series of additions or deductions to reflect both positive and negative externalities associated with that consumption" (see Talberth *et al.* 2007:4). Hence, the commonsensical operational procedures still prevail.

However, commonsensical accountancy does play a less significant role in this GPI than it did previously. For the first time at *Redefining Progress*, the authors argue that there *is* a *theoretical* foundation for the US GPI: "the Fisherian concept of welfare equivalent income—because it attempts to measure the net psychic income households derive from their consumption activities" (see Talberth *et al.* 2007:4). They utilise a similar approach to the normative social choice theory as outlined by Clarke and Islam (2004).[114] That is, the core principles of sustainable development vis-à-vis the 'environment' and 'social' domains are embedded within the GPI. For example, the key sustainability principle from the environment domain is the principle of thermodynamic efficiency, i.e. from a normative standpoint, the approach calls for

[113] These authors also calculated a GPI for nine counties in the San Francisco Bay area, but as only a single year was *briefly* studied (2000), I did not subject it to critical analysis.

[114] In *Chapter 3*, 'Fisherian net psychic income' and 'social choice theory' were examined as two separate theories.

recognition of the limits imposed on the economic system by the first and second laws of thermodynamics. In the realm of social sustainability, the GPI makes an explicit adjustment to personal consumption expenditures for improvements or declines in distributional equity. In summary, the theory of the reconstructed US GPI is primarily based on "entropic net psychic income", and certain aspects of social welfare economics such as social choice theory.

Moreover, the authors realise that there are lingering theoretical and methodological criticisms of the GPI.[115] For instance, they state that in terms of GPI components, the most important critique is that the GPI is ad-hoc in what it includes or implicitly excludes as contributors to or detractors from welfare (à la Neumayer 1999). And, that there are components of current welfare that have little apparent link to long-term sustainability. According to Talberth *et al.* (2007), a major theoretical weakness is that the GPI purports to be based on the principle of strong sustainability, but it actually measures weak sustainability. This is because GPI measures the loss of both ecological and durable fixed capital separately. The authors do not attempt to resolve any of these criticisms.

But, the authors' attempt to solve an ongoing critique developed by Dietz and Neumayer (2006b): that the threshold effect found in most GPI and ISEW studies is essentially an artifact of methodological flaws than a true reflection of welfare growth and decline.

> We believe this update has at least partially remedied some of those concerns. For instance, in the calculation of long term environmental damage, we have discarded any assumptions about growth in this damage and, instead, tied damage calculations to actual carbon emissions and the estimated marginal social costs of those emissions. In several other columns, assumed growth rates were replaced by actual data so it remains unclear the extent to which the "hard wired" threshold effect hypothesis Dietz and Neumayer (2006b) suggest still applies. [Talberth *et al.* 2007:19]

They humbly conclude that there is potential room for improvement in their methodology and other approaches should be considered (see Talberth *et al.* 2007:20). This study shows a level of maturity in which the GPI accounts have been constructed.

Furthermore, Talberth *et al.* (2007) are the first to use GPI time-series data to analyse the welfare impacts of policy change in relation to greater trade openness. Economic openness is the ratio of trade activity (imports

[115] Not including the various criticisms raised in *Chapters 3 to 6*.

and exports) to GDP. They replicate and partially update Talberth and Bohara's (2006) analysis with respect to the new US GPI accounts.[116] "The [updated] results provide some empirical support for the burgeoning literature associating greater openness with environmental degradation, income inequality, and an increase in economic activity that may be self cancelling from a welfare perspective" (Talberth *et al.* 2007:25). Talberth and Bohara (2006) also modelled the effects of changes in economic openness, the growth rate of carbon dioxide emissions and livestock production on the gap between GDP and GPI, and found each to have a significant, positive influence on the rate of growth of this GDP–GPI gap. In their newest study, they adopt that model and substitute the livestock variable for an urban growth parameter—a variable of significance to the policy debate over the degree of urbanization. Thus, Talberth *et al.* (2007) add a new dimension to the GPI literature by extending their analysis to include urban sprawl, which is measured in terms of urban land area per capita.[117]

In relation to whether or not urban sprawl enhances or detracts from welfare, they find that the net effects are ambiguous, yet worth exploring in a more systematic fashion. But they found a positive relationship between the GDP–GPI gap and growth in urban land area per capita. According to the authors, this suggests that on balance, the personal consumption, time savings, and public infrastructure benefits from sprawl are more than counteracted by the costs associated with traffic congestion, auto accidents, carbon emissions, and lost farmland (see Talberth *et al.* 2007:27). These are intriguing results. Moreover, the authors portray the real worth of critically evaluating the gap between GDP and GPI. In short, the legitimacy of a GDP–GPI gap has been strengthened by the work of Talberth and Bohara (2006) and Talberth *et al.* (2007).

Their GDP and GPI accounts (per capita) suggest that while the US economy has grown steadily since 1950, collective welfare may have peaked in the late 1970s and stagnated in the 1980s–2000s as the costs associated with income inequality, loss of time spent on non-market activities, and environmental degradation outweigh the benefits of economic growth, as shown in *Figure 4.16d* and *Table 4.16d* below:

---

[116] Briefly, their earlier (2006) study utilised panel data spanning 30–50 years from eight countries (Australia, Austria, Brazil, Italy, Netherlands, Sweden, United Kingdom, and United States) with so-called green-GDP accounts (e.g. GPI and ISEW) and an aggregate production function model. They found a strong negative relationship between openness and the net welfare indicator and a strong positive correlation between openness and the gap between GDP and ISEW/GPI. The effects, however, were non-linear, signifying that up to a point, greater openness is beneficial (see Talberth and Bohara 2006). Their study is unique because most studies relating openness to higher economic growth rates rely almost exclusively *on GDP* and related measures (i.e. not green-GDP).

[117] They also demonstrate the potential use of GPI data to inform the debate over tax cuts and other adjustments to tax policy.

Figure 4.16d. US GDP and GPI, 1950–2004

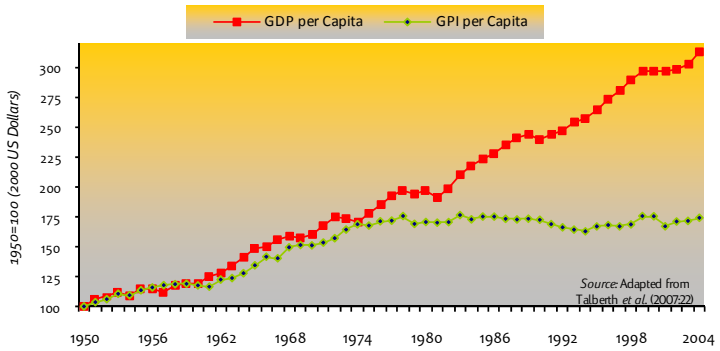
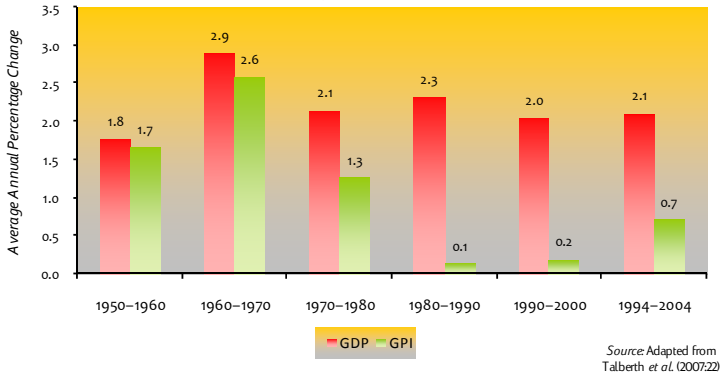


Table 4.16d. US GDP and GPI (per Capita Real Growth Rates), 1950–2004



Paraphrasing what the authors say: we find a prominent trend that while GDP growth rates have more or less fluctuated within a positive range, GPI growth rates fall into two distinct periods. In the first period, spanning 1950 to 1980, GPI per capita growth rates roughly match those of the GDP and are generally positive (e.g. see *Table 4.16d*). Beginning in 1980, GPI growth rates are generally negative or marginally positive. When GPI is falling, it implies that the economic system is eroding the stocks of natural and social capital on which all goods and services flows depend and limiting the next generation's prospects. The implication is that this trend might be good evidence of a "threshold" effect. This is how the authors observe the trends between GDP and GPI.

But their degree of historical specificity is vacuous because, in effect, they are simply interested in 'periods'. There is not enough inquiry into the real socioeconomic processes of US capitalism. It is critical to have a good understanding of how society has come to where it is; explaining *why* there might be problems is useful, practical and therefore very important for political economy research. Therefore, we will scrutinise the US GPIs (and the US ISEW) in more detail in *Section 4.11*, offering a comparative institutional analysis of the five national-level studies. For now, we will evaluate the Australian GPIs, beginning with study one in *Section 4.5.2* below:

4.5.2 Australian GPI (1)

Hamilton, Clive (1997) *The Genuine Progress Indicator: A New Index of Changes in Well-being in Australia*, The Australia Institute, Canberra, Discussion Paper Number 14.

Hamilton, Clive (1999) "The Genuine Progress Indicator Methodological Developments and Results from Australia", *Ecological Economics*, vol. 30, pp. 13-28.

Hamilton, Clive and Richard Denniss (2001) *Tracking Well-being in Australia*, The Australia Institute, Discussion Paper, No. 35.

There are three main works to consider for the Australian GPI (study one), but only two sets of time-series were constructed. The study by Hamilton (1997, 1999) covers the 1950–1996 period, while Hamilton and Denniss (2001) cover the 1950–2000 period. Hamilton's (1999) paper is a condensed version of Hamilton (1997). Hamilton and Denniss (2001) at *The Australia Institute* only extend the trend sequence of the GPI by four years, and they add a few minor (yet good) technical improvements. In this section, we will discuss the three papers together since the principal innovations were put forward in the original paper (Hamilton 1997) and (most) have been carried forward to Hamilton and Denniss (2001).

According to Hamilton, GPI attempts to measure the broader impact of economic growth, mainly those transactions that fall outside the system of national accounts. The national accounts that generate GDP fail to recognise that the growth process produces 'ill-being' in addition to well-being, 'bads' as well as goods. The reason for the inquiry into devising alternative indicators to GDP is that measures of national progress have been bound inseparably to the *price system*. For instance, only when the market captures the spread of paid childcare, fast food and the employment of housekeepers do they *appear* to add to our well-being—because they now have price tags. In other words, the contribution of family, community, and the natural environment, which lie outside the marketplace, simply do not count. People do not experience economic growth as such, rather, they experience a complex set of economic and social changes that affect their daily lives.

As a polemist of GDP growth fetish, Hamilton (1997, 1999) justifies the development of a composite well-being index, the GPI, as follows:

> [T]he selection of components is not arbitrary but follows some rules. The process begins by identifying the deficiencies of GDP as a measure of welfare and asks how it would need to be changed to make it a better measure. In doing so, it builds a framework for measuring sustainable consumption. ... Thus the GPI is not 'arbitrary' in the sense that its authors simply add in components at random. In each case, there is an identified problem with GDP as a measure of welfare, and an attempt is made to fix it so far as is permitted by availability of data. [Hamilton 1999:4]

Concurrently, Hamilton reveals a major flaw in the GPI accounting framework: placing dollar values on things that convert ethical values into economic ones is a process that for many people actually devalues the environment and human life. "It is not possible to develop the concept of NNP into an exact indicator of sustainability on the basis of current price information, which flags the *general problem of attempting to estimate sustainable consumption using prices* that reflect objectives other than sustainability" (Hamilton 1999:14, emphases added). Nonetheless, he argues that the modifications to GDP are necessary, and they form the basis of the GPI's foundation (see Hamilton 1999:15, Hamilton and Denniss 2001:8). This is done by utilising the *commonsensical operation procedure*—only this time, according to the authors, we are trying to measure "sustainable consumption".[118]

Methodological/technical improvements

Firstly, it is important to note that Hamilton makes some interesting methodological contributions to the debate. Unique to the literature, this Australian GPI includes measures of the costs of problem gambling and an assessment of the value of advertising, on the basis that most are designed to be persuasive rather than informative, creating new 'needs' rather than fulfilling existing ones (à la Zolotas' EAW). In addition, there is an inclusion of a pertinent environmental factor for Australia, the 'costs of irrigation water use'. The authors account for the social welfare of the heterogeneous population, by focusing on 'problem gamblers'. Hamilton notes, "it makes no sense to count an increase in spending by gambling addicts as an addition to national welfare, so the GPI deducts expenditure on gambling by problem gamblers from total consumption expenditure" (Hamilton and Denniss 2001:x).

There are some important comments to make regarding their GPI assessment of defensive costs. Hamilton (1999:16-7) argues that if some part of consumption expenditure does not represent an addition to welfare, but is undertaken to offset some other impact, it is quite legitimate to deduct it to obtain a better measure of welfare irrespective of whether the decline can be attributed to the growth process itself. That is, 'defensive expenditures' are designed to maintain welfare in the face of a deteriorating environment (e.g. a declining sense of personal security) (Hamilton and Denniss 2001:ix). But, "[t]his applies to *private* expenditures on *social welfare*" (Hamilton and Denniss 2001:10, Hamilton 1999:17, emphases added). It appears, therefore, that defensive expenditures are individual *and* social phenomena. This meshing of individual and social elements could be a problematic

[118] For instance, the typical assumption is adopted, that increases in personal consumption (adjusted for the distribution of income) reflect an increase in welfare.

assumption; as Clarke and Islam (2004) argued, the "*social* choice" perspective is different to aggregating individual choices. However, with the GPI (and much like most of the ISEW studies), the distinction between individual and social processes is unclear.

Techniques and original 'theoretical' contributions to the GPI

The objective is to measure the annual flows of marketed and non-marketed goods and services more comprehensively. Specifically, the interest is in *sustainable consumption* over a given period (see Hamilton 1999:7). Sustainable consumption depends on maintaining the productive potential of the capital stocks that are needed to generate the flow of goods and services that are consumed. For the first time in a GPI study, Hamilton and Denniss (2001:8-9) attend to five types of capital stocks: 1) built capital; 2) financial assets; 3) natural capital; 4) human capital; and 5) social capital. But, the authors only consider changes in stocks/flows of built and natural capital.[119] That is, human, social as well as financial capitals are *not* included in the estimate for the Australian GPI.

The authors also converse on the substitutability among the five capital assets. Yet again, the chief focus is between ecological and final artefact capital (i.e. 'consumption'). They have taken the view that for particular classes of ecological capital, complete substitutability between built and natural assets is not a valid assumption. Hamilton then links all the different types of capital (and their substitutability) back towards 'sustaining' consumption. The authors identify the following non-substitutable aspects of ecological capital: the depletion of fossil fuel based energy, especially oil and gas (i.e. not coal); destruction of old growth forests; ozone depletion; long-term environmental damage; land degradation; and costs of irrigation water use. In other words, these are the present activities undermining the sustainability of the natural resource base future generations.

More specifically, the strength of the Australian GPI (study one) is that it is principally based on *strong sustainability*. These ideas closely resemble one key element of the "economics for community" theory, that income is in principle based on strong sustainability. Hamilton accepts that particular forms of ecological capital, e.g. minerals such as iron ore, bauxite and copper ore, would have no binding or serious constraint imposed on global consumption growth. This is because both induced and autonomous technological changes have provided, and will continue to provide, substitutes to some emerging scarcities. Already there is a shift towards dematerialisation of consumption activity, and recycling technologies are advancing rapidly in some activities which remain

[119] The authors argue that monetizing the welfare derived from human and social capital is too complex and unethical.

resource intensive (Hamilton 1999:17). Thus, Hamilton has a more optimistic outlook towards minerals. However, he takes a much less optimistic position concerning energy sources. He says that consumption of energy is essential to all economic activity, including those activities required for the most basic level of subsistence. For instance, he states, "the uniquely valuable attributes of petroleum as a transport fuel, for which no truly sustainable substitutes would appear to be available except at much higher costs" (Hamilton 1999:18). Therefore, the authors conclude that in the case of irreplaceable assets (such as soil and old-growth forests and non-renewable energy resources), any decline in the capital stock in one year will generate a stream of future losses, so that the cumulative losses must be taken into account.

In order to prevent the depreciation or depletion of capital stocks a portion of current consumption needs to be 'set aside' to replenish the stocks. The implication according to the authors is that unlike the way in which changes in GDP are used, year-on-year changes in the GPI are not very meaningful. The main application of the GPI is to illustrate *trends over time* (see Hamilton 1999:14, Hamilton and Denniss 2001:7). In fact, "[t]he absolute levels of the GPI and GDP are not comparable because GDP measures economic activity while the GPI is a measure of changes in welfare" (Hamilton 1999:25). For the Hamilton (1997) study, the Australian GDP per capita and GPI over the 1950–1996 period are depicted in *Figure 4.17a* and *Table 4.17a* on page 172. The results below show that there has been a sharp divergence between GDP and the GPI since the early 1980s. The decline in the GPI since the late 1970s would have happened earlier except for the impact of a considerable measured improvement in income distribution in the 1970s. The key factors explaining the breakdown of sustainable economic welfare in Australia since the late 1970s have been unsustainable levels of foreign debt; the growing costs of unemployment and overwork; the combined impact of a number of environmental problems including GHG emissions; the escalating costs of energy resource depletion; and a failure to maintain investments in the national private, business and public capital stock.

The major difference between the earlier (Hamilton 1997) and revised (Hamilton and Denniss 2001) Australian GPI is that the 1950–1996 study required development of an index of changes in income distribution using the share in total income of the *lowest quintile*, while the 1950–2000 study entails a calculation of an Atkinson Index (which allows for society's aversion to inequality). Comparing the previous 1997 study to the updated 2001 study, the latter study shows that GPI per capita performance in the 1970s is much slower, and in the 1980s it is much higher. Utilising a wider social and environmental accounting method in Hamilton and Denniss (2001) portrays a divergent trend between GDP and GPI, as shown in *Figure 4.17b* and *Table 4.17b* on below:

Figure 4.17a. Australian GDP and GPI (1950=100), 1950–1996

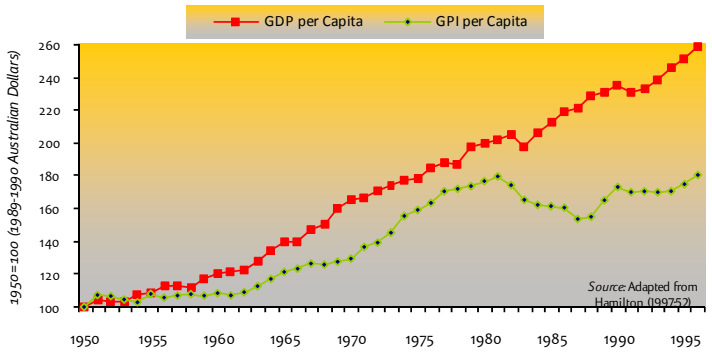


Table 4.17a. Australian GDP and GPI (per Capita Real Growth Rates), 1950–1996

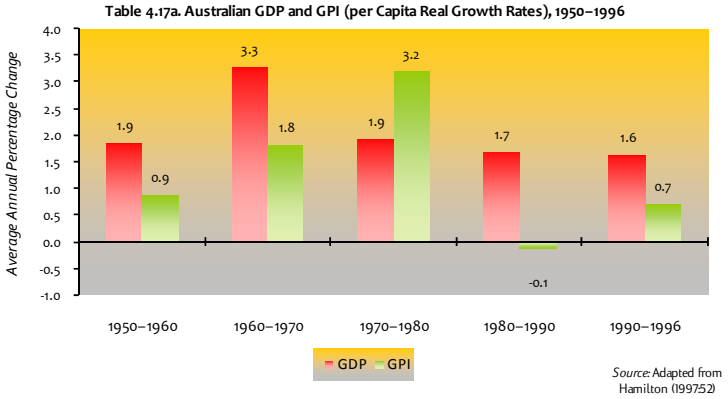


Figure 4.17b. Australian GDP and GPI, 1950–2000

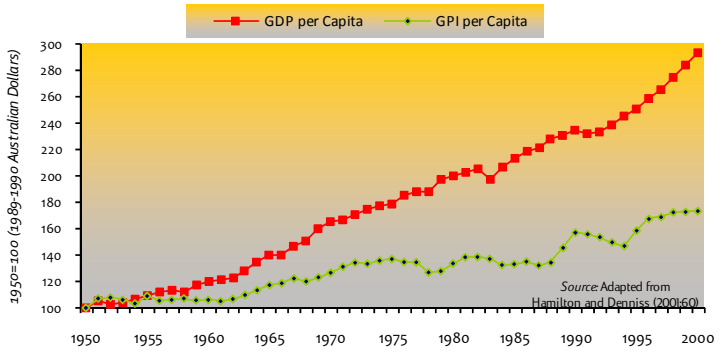
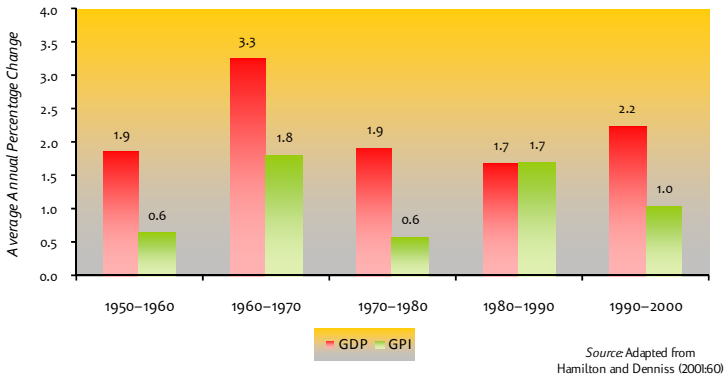


Table 4.17b. Australian GDP and GPI (per Capita Real Growth Rates), 1950–2000



Over the 1950–2000 period, while real GDP per capita has grown at an average annual rate of 2.2 percent, the GPI per capita has grown at only 1.2 percent. The 1950s was a period of weak GDP growth per capita, while the 1960s was the only post-war decade of rapid growth. From a historical perspective, the whole period since the 1960s underlies the weakness of Australia's economic performance for most of the period studied. Rising growth rates of GDP over time are typically construed as verifying that Australians have become significantly materially better off, but the welfare 'gap' growth trend between GPI and GDP per capita has widened considerably since the 1970s. This growing gap trend is worrisome.

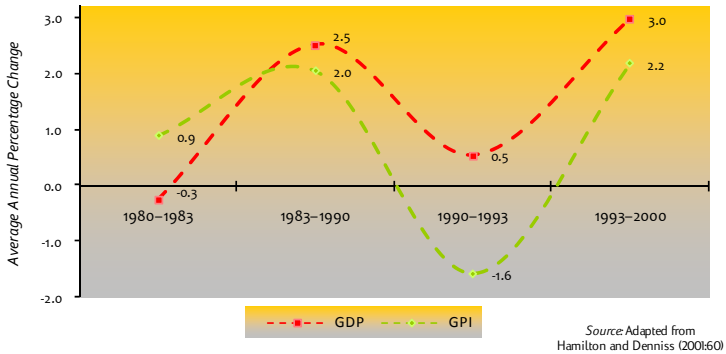
However, the major problem is that the authors provide no socio-historical context in both studies; they simply concentrate on the gap between GDP growth and the GPI. The predicament is more evident in Hamilton and Denniss (2001). For instance, consider the results in *Table 4.17b* above. The average annual real growth rates in GPI per capita were 0.6% during both the 1950s and 1970s. However, in the 1960s *and* 1980s, respectively, average annual rates of real GPI per capita growth were 1.8% and 1.7% (i.e. about the same progress of socioeconomic and environmental performance over each period). The rates of GPI growth were three times higher in the 1960s and 1980s than in the 1950s and 1970s. But, the authors have not placed the Australian GPI trend results in the context of long waves of societal growth and development over the whole period.[120] For the average Australian, the 1960s was characterised by a high and rapid GDP growth phase (i.e. no major recessions) and underwent a 'short-wave upswing', but the 1980s was a 'short-wave downswing' of capitalist growth and development (see O'Hara 2008b:97). Thus, it is difficult to understand Australia's actual progress during these economically diverse times, as represented by the real GPI per capita.

Some critical questions arise: What is the 'true' depiction of society's progress during the various cycles? Does sustainable economic welfare progress or regress when the economy grows? Does social and environmental welfare progress or regress during recessionary times? Consider the Australian economy, which was subject to a typical business cycle during 1980–2000. For a more detailed analysis over this period, it would be better to use change *per quarter* in order to make the changes in the business cycle comparable in segments of different length. But because the net welfare indicators are constructed on a yearly (not quarterly) basis, we are confined to *annual* average percentage changes in GDP per capita over real historical time. There were two recessions

[120] There is extensive literature on long waves of capitalist growth and decay (e.g. see Mager 1987, Mandel 1995, Silver 1992).

during the early-eighties (1980–1983) and early-nineties (1990–1993). There was a speculative financial/property boom during the mid-to-late 1980s (1983–1990) and an economic boom of the mid-to-late 1990s (1993–2000). Adapting data from Hamilton and Dennis (2001), the trends of GDP and "sustainable consumption" (GPI) growth per capita during 1980–2000 largely mirrored each other, as shown in *Figure 4.17c* below:

Figure 4.17c. Australian GDP and GPI (per Capita Real Growth Rates), Recessionary and Boom Cycle, 1980–2000



Source: Adapted from Hamilton and Denniss (2001:60)

This is a fascinating result. The figure shows that real GDP growth per capita was low during recessionary times when real GPI growth per capita was also relatively low. During the expansionary phases, growth in real GDP per capita was high when real GPI per capita was also high (i.e. progressing). That is, Australian "sustainable consumption" grew strongly during the speculative boom of 1983–1990 and the upswing of 1993–2000. This contradicts their main hypothesis of the divergence between GDP and GPI. The trends of both GDP and GPI essentially run parallel—which GPI authors avoid pointing out. Unfortunately, the authors are only engrossed in the GDP–GPI 'gap' over the whole period (1950–2000). Overall, the authors have provided a relatively good contribution in relation to techniques, methods and some theory, but their *socio-institutional analysis* is weak because they do not consider net welfare vis-à-vis the cyclical instability of capitalism.

4.5.3 Australian GPI (2)

Lawn, Philip A. and Matthew Clarke (2006b) *Measuring Genuine Progress: An Application of the Genuine Progress Indicator*, New York: Nova Science Publishers, Inc.

Clarke, Matthew and Philip A. Lawn (2007) "Comparing Australia's Genuine Progress to its Economic Growth Performance", *International Journal of Green Economics*, vol. 1 (3/4), pp. 513-531.

The work by Lawn and Clarke (2006b) generates a strong case for the application of the Genuine Progress Indicator (GPI). The GPI is an effort to integrate the concepts of 'sustainability' and 'well-being' into the one measure. It is the first book in the literature to be entirely devoted to the methodological, empirical and technical aspects of the GPI. The authors

are specifically interested in constructing a GPI as a case study for the state of Victoria, the second largest economy in Australia. But they also calculate a GPI for Australia and the Rest-of-Australia (the Australian GPI 'minus' the Victorian GPI). The authors aim to reveal the extent to which the sustainable well-being of the average Australian (or Victorian) has advanced over the study period (1986–2003).

Summary versions of chapters from their book have been published in international and Australian academic journals. There is no need to scrutinise each article individually, as the nature of the content covered is virtually identical to their book. Of course, it is best to partition the empirical enquiry at two levels, the national and subnational. But, the methodology, conceptual, and technical details are the same for the Australian GPI as they are for the Victorian GPI, so there is no need to repeat these details when investigating Victoria's GPI. We will examine the common essentials below, followed by an empirical analysis of the Australian GPI (version two).

The authors argue that GDP and gross state product (GSP) were never designed to be indicators of sustainable well-being. Hence, the construction of the GPI is mainly based on overcoming the shortcomings associated with GDP, GSP and Hicksian income. But they believe the deployment of the GPI is a *partial* solution to the problem of growth fetish.[121] Their GPI is not purely based on commonsensical accountancy either. They believe that the GPI is congruous with Lawn (2003), i.e. it is soundly based on entropic net psychic income. Thus, the authors do not deem it necessary to develop or reconstruct their theoretical foundation (see Lawn and Clarke 2006b:111).

However, the authors do endeavour to improve on one of the indicator's most significant (and controversial) components, "personal consumption expenditures". They note a few contemporary problems of 'consumerism', but they choose not to confront this issue.[122] Instead, they are more interested in the real welfare-related benefits that consumption entails. Besides, the authors see consumption as a 'necessary evil': "[i]t is necessary in the sense that one must consume and, in a sense, destroy goods to experience the benefit they yield. But if more consumption can be enjoyed without having to place greater stain on families, social relationships, and the natural environment, the evil side-effects of consumption can be contained" (Lawn and Clarke 2006b:21-2).

For the first time in the literature, the authors attempt to include a 'qualitative' dimension of consumption by *rigorously* adjusting

[121] Indeed, the authors (briefly) look at numerous social and environmental indicators and statistics on issues other than those covered in the GPI, such as overwork, household affordability and obesity. But they do not link them to their empirical study of the GPI.

[122] This position has still not changed in their latest book, *Sustainable Economic Welfare in the Asia-Pacific* (see Lawn and Clarke 2008e:52).

consumption expenditures by defensive and rehabilitative expenditures. Defensive and rehabilitative expenditures are not welfare-enhancing because they merely serve to maintain and restore the "productive capacity of the economy" (Lawn and Clarke 2006b:22). It would be double counting if these regrettable expenditures were included in the personal consumption expenditures item. There may be a clear benefit which emerges from such defensive and rehabilitative spending, nevertheless "it is not felt in the present but in later years by way of future consumption" (Lawn and Clarke 2006b:22). They show three separate measures of "adjusted consumption". The measure varies to the extent that defensive and rehabilitative spending is deducted from personal consumption expenditures. But their preference is for a *strict* array of adjustments vis-à-vis defensive spending: food; electricity, gas and fuel; the operation of vehicles; transport services; communications; hotels, cafes and restaurants; and insurance and other financial services. This austere view of adjustments made to the consumption category (in the System of National Accounts) is a major innovation in the literature of net income indices.

In addition, the authors are the first to question the usefulness of comparing real GDP or GSP growth with the GPI. Real GDP/GSP simply reflects the percentage rise in the quantity of goods and services produced from one financial year to the next. The indicators do not indicate the amount by which the number of goods has declined. For an economy to grow in physical scale, the amount of *durable* goods added to the existing stock (production) must exceed the amount by which the existing stock declines (depreciation). Therefore, to take into account the degree to which the physical scale of the economy expands or contracts, the authors are interested in the net capital investment (NCI). The NCI equals the investment in all human-made capital minus the depreciation of all human-made capital (i.e. producer *and* consumer durables). Thus, a comparative analysis between NCI and the GPI is potentially meaningful.

However, the authors have overlooked the fact that disembedded capitalism thrives on real GDP/GSP growth—regardless of whether the stock of durable human-made capital has depreciated—the more goods produced and consumed the 'better' it is for the system (barring the "second contradiction"). Therefore, we will consider both NCI and GDP in our review of their empirical results. The NCI per capita fluctuated more wildly than GDP per capita over the study period (1986–2003). Yet in both instances, their empirical results confirm that beyond 1993 GPI per capita did not accelerate in the same manner as real GDP and NCI, as shown in *Figures 4.18a,b* and *Tables 4.18a,b* below:

Figure 4.18a. Australian Net Capital Investment (NCI) and GPI, 1986–2003

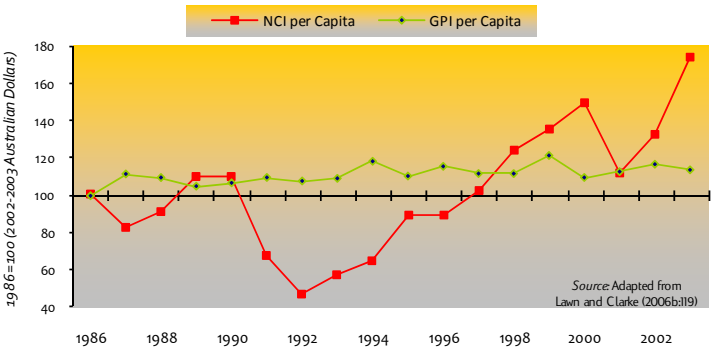


Table 4.18a. Australian NCI and GPI (per Capita Real Growth Rates), 1986–2003

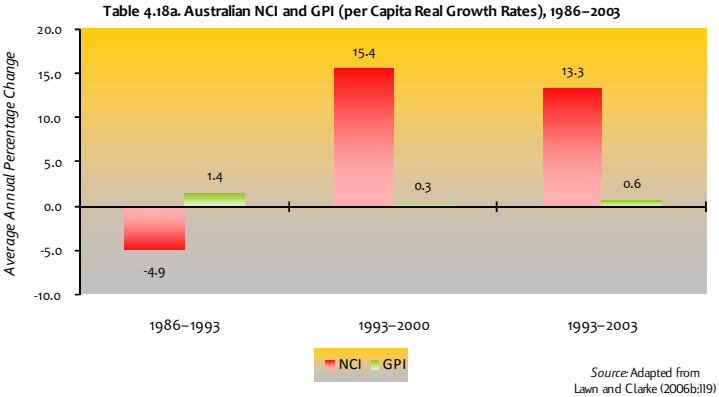


Figure 4.18b. Australian GDP and GPI, 1986–2003

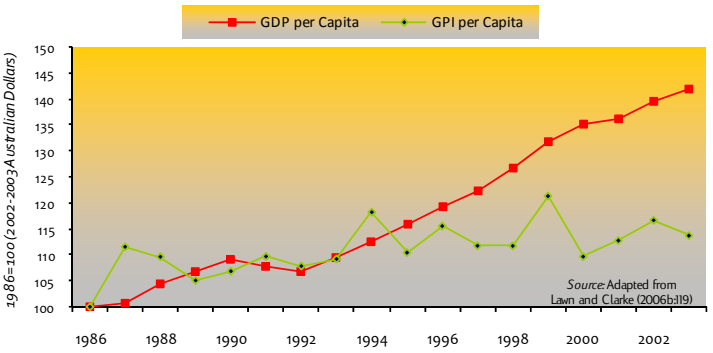
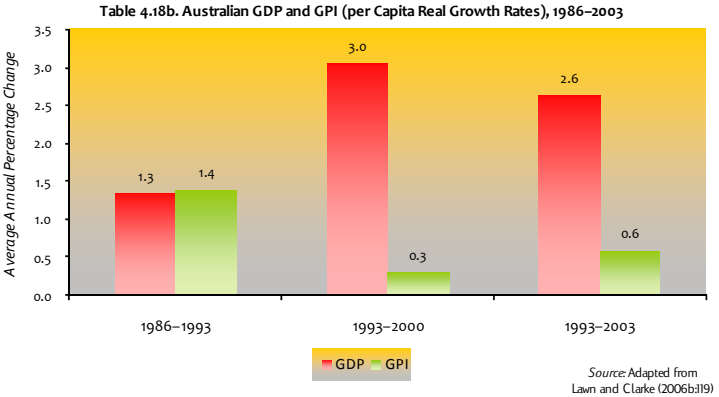


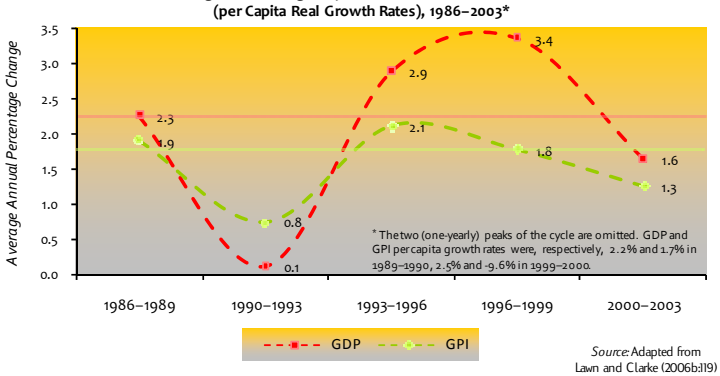
Table 4.18b. Australian GDP and GPI (per Capita Real Growth Rates), 1986–2003



Clarke and Lawn (2007:521) conclude that "[b]eyond 1994, the growth rate of Australia's GPI was unable to keep pace with the rate of increase in Australia's per capita GDP". The advocates could not have asked for anything better to support the threshold hypothesis.

On the contrary, they pay no attention to the business cycle. In *Business Cycles*, Schumpeter (1939:169,173-4) argued that cycles are of the essence in capitalism; and it follows that depressions are an inescapable and even (a potentially) beneficial phase in its evolution. The Juglar cycle was probably one of the most plausible and important of the cycles he studied.[123] The 1986–2003 period for Australia can be broken down into the following cycles: boom (1986–1989); recession (1990–1993); upswing (1993–1996); boom (1996–1999) and downswing (2000–2003). Their supposition that GDP growth is detrimental to "genuine progress" crumbles when we dissect their study into the broad periodicity of the (8–11 years) Juglar cycle. For consistency and comparability over the 1986–2003 period, the business cycle is divided into three-year periods and the peak of the booms between 1989 *and* 1990 and 1999 *and* 2000 are omitted, as shown in *Figure 4.18c* below:

Figure 4.18c. Juglar Cycle: Australian GDP and GPI (per Capita Real Growth Rates), 1986–2003*



Source: Adapted from Lawn and Clarke (2006b:19)

In the figure above, the trends of the average annual percentage changes of GDP and GPI largely mirrored each other. During the upswing/boom times of 1986–1989 and 1993–1999, real growth of GDP per capita was medium-high (2.3% and above), and real growth of GPI per capita was relatively medium-high (1.8% and above). It is also the case during the recession of 1990–1993 and the downswing of 2000–2003, when the average growth rates of GDP and GPI are less than 2.3% and 1.8% per annum, respectively. Our examination of the Australian business cycle suggests that the indicator of "sustainable well-being", the GPI, is roughly as good as the very measure the advocates want to debunk, GDP. A lack of information regarding the cyclical situation leaves the reader uninformed. Indubitably, Wesley Mitchell and Simon Kuznets

[123] Named after Clément Juglar (1819–1905), the cycle covers a range of seven to eleven years.

would have been alarmed of such paucity in critical commentary in relation to the economic growth cycle.

Furthermore, the authors have a less detailed analysis of the social problems, especially when compared to their historical reading of environmental issues. Overall, their worldview of social problems is a bit too restricted and one-dimensional. For example, the undermining of human relations, family life, responsibility and a loss of sociality are simply revealed in terms of an increase in the 'cost of crime' and 'family breakdown'. Taken in isolation, the increase in "social costs" over the study period was significant. But, when combined in the net income index with all the other 'item adjustments', the costs to society were hardly measurable. On the other hand, the authors possess a good understanding of the Australian natural landscape, for example, citing the substantial impacts on inland river health and neighbouring ecosystems from excessive irrigation water use. Their analysis and understanding of the ecological problems is very good. What we learn from Clarke and Lawn (2007:523-7) is that the real value of the Genuine Progress Indicator rests in its de-construction, i.e. the *disaggregated account*. Besides, perhaps there is more significance to the GPI in a comparative analysis of Australian "sustainable well-being" with Victoria? The next major section will study the GPI and the ISEW at the subnational, and where applicable, comparative to the national level, following a summary of the national GPI studies in *Sections 4.5.4 and 4.5.5* below:

4.5.4 Summary of the National GPI Studies

The US GPI by Cobb *et al.* (1995) is more advanced than the original US ISEW, as it was the first attempt to account for "social" dimensions of well-being. It is what Daly and Cobb (1989) really wanted to convey in their original ISEW measure, an "economics for community". However, the main 'theory' of the US GPI is based on a bookkeeping procedure of *commonsensical accountancy*. Whilst this formula has a less significant role in the most recent study at *Redefining Progress*, the authors do not make any major theoretical improvements to suggest otherwise.

In contrast to the ISEWs, there are many good socio-historical analyses, namely, the US GPIs written during 1999–2002 (e.g. Anielski *et al.* 1999, Cobb *et al.* 2000, Cobb *et al.* 2001) and the 2006/2007 studies (Talberth and Bohara 2006, Talberth *et al.* 2007). For instance, Cobb *et al.* (1999) examine the contradictory role between industry and finance and link their analyses to the trend of the US GPI. There is also a good socio-institutional analysis of the poignant problems faced by the modern youth of America. Unfortunately, other authors have forgotten about the industry–finance and individual–community trade-offs, e.g. the problems are only parenthetically mentioned by Venetoulis and Cobb (2004).

However, there are limits to which the GPI can tell a good story about social relationships. The heterogeneity of persons-in-community is unable to be fully expressed within the GPI. They inadvertently show the limitations of constructing an all-in-one indicator of "genuine progress": the authors had a far superior disaggregated account of real socioeconomic processes and institutions to their aggregated inquiry.

Specifically in their aggregated account, five out of the six US GPI studies do not examine the role that *economic growth* played in enhancing (if at all) the GPI over the period of study. The 2006/2007 studies, however, is highly original in that it uses GDP and GPI time-series data to scrutinise the welfare impacts of policy change in relation to greater trade openness. For example, Talberth *et al.* (2007:25-7) show that critically evaluating 'the gap' between GDP and GPI has significance. However, none attempts to explain the link between a *relatively* low GDP over the mid-1970s to mid-1990s *and* the worsening GPI over the same period. Effectively, the US authors' empirical applications have delinked *the GDP*—but not necessarily the GPI—from the capitalist system.

The 'theory' of the first group of Australian GPI studies is similarly based on the commonsensical operation procedure. The forte of the Australian GPI (study one) by Hamilton (1997, 1999), Hamilton and Denniss (2001) is that it is *principally* based on strong sustainability. It makes a good contribution in relation to techniques and technical measurement of "sustainable consumption". The authors of the Australian GPI (study two), Lawn and Clarke (2006b) and Clarke and Lawn (2007), also make some good advances in technique and method, albeit their measure is not founded on commonsensical accountancy. The authors of the Australian/Victorian study argue that their indicator is soundly based on entropic net psychic income. Their main innovation lies in their attempt to include a better measure of the services flowing from artefact capital (by adjusting consumption expenditures by defensive and rehabilitative expenditures in a more rigorous manner). In addition, the authors are the first to question the usefulness of comparing real GDP growth with GPI. They are more interested in the physical scale to which the economy grows as reflected in the net capital investment (NCI) measure—an important and relevant contribution to the literature.

However, the problematic common to both study one and two of the Australian GPIs is that there is a relatively poor *socio*-institutional analysis. This contrasts greatly to the good analyses that were characteristic of the US GPI studies. But the Australian authors have a very good *ecological*-historical account. On the other hand, they underplay the paralleling trends of GDP and the GPI per capita over the business cycle, e.g. they ignore the economic crises of the early 1980s and 1990s in

their trend analyses. A lack of historical specificity vis-à-vis the cyclical situation leaves much more room for improvement.

4.5.5 The National GPIs Studies in *Sustainable Welfare in the Asia-Pacific*

Lawn, Philip A. and Matthew Clarke (2008d) *Sustainable Welfare in the Asia-Pacific: Studies Using the Genuine Progress Indicator*, Cheltenham, UK: Edward Elgar.

PART I: INTRODUCTION TO THE ASIA-PACIFIC REGION AND THE GENUINE PROGRESS INDICATOR
1. An Introduction to the Asia-Pacific Region (Lawn and Clarke 2008c)
2. Why is Gross Domestic Product an Inadequate Indicator of Sustainable Welfare? (Lawn and Clarke 2008f)
3. What is the Genuine Progress Indicator and How is it Typically Calculated? (Lawn and Clarke 2008e)
4. In Defence of the Genuine Progress Indicator (Lawn and Clarke 2008b)
PART II: MEASURING THE GENUINE PROGRESS OF ASIA-PACIFIC NATIONS
5. Genuine Progress in Australia: Time to Rethink the Growth Objective (Lawn 2008a)
6. Calculating the New Zealand Genuine Progress Indicator (Forgie *et al.* 2008)
7. Genuine Progress in Japan and the Need for an Open Economy GPI (Makino 2008)
8. Genuine Progress in India (Lawn 2008b)[124]
9. From GDP to the GPI: Quantifying Thirty-Five Years of Development in China (Wen *et al.* 2008)
10. Genuine Progress in Thailand: A Systems-Analysis Approach (Clarke and Shaw 2008)
11. Genuine Progress in Vietnam: The Impact of the Doi Moi Reforms (Hong *et al.* 2008)
PART III: GENUINE PROGRESS ACROSS THE ASIA-PACIFIC REGION
12. Genuine Progress Across the Asia-Pacific Region: Comparisons, Trends, and Policy Implications (Lawn and Clarke 2008a)

Unfortunately, a detailed analysis of the works contained in *Sustainable Welfare in the Asia-Pacific: Studies Using the Genuine Progress Indicator*, edited by Philip Lawn and Matthew Clarke (2008d), was not subjected to our critical evaluation. The book was published near the completion time of this manuscript. Only a laconic review is offered. The various authors of *Sustainable Welfare in the Asia-Pacific* present seven GPI case studies for the following areas: Australia, China, India, Japan, New Zealand, Thailand, and Vietnam. The GPIs are constructed for seven countries in the Asia-Pacific region at various stages of industrialisation, with vastly different political, social, and cultural characteristics. Around 20 individual benefit and cost items are combined into a single monetary-based index. The contributors have endeavoured to follow a consistent methodology, and the overall argument is that GPI is considered more comprehensive than a piecemeal approach to sustainable development.

On page 48 of their book (Ch. 3), Lawn and Clarke (2008e) merely include one small note on the GPI theoretical foundation, referring to Lawn (2003). The reason why they use GPI is that they wanted to raise the profile of the index and increase the public appeal for an alternative welfare indicator to GDP. The GPI is thought to be conceptually sound, "although debate continues as to which items should be included in the GPI" (Lawn and Clarke 2008e:64). In other words, theorising about the GPI is not necessary to any further extent since in their view the conceptual groundwork, that is to say, the 'entropic net psychic income' version, is considered strong. Apparently, according to the editors, the valuation methods remain the main problem.

[124] Much of what is written in his chapter has been transferred into a journal article (Lawn 2008c).

There is no mention of capitalism in the book. Nevertheless, the authors have made some noteworthy contributions and have come to the forefront of the majority of research published on SEWIs. In the past, GPI accounting has attempted to measure sustainable welfare in a purely national context. Some exceptions to this include the incorporation of net foreign borrowing/lending and long-term environmental damage.[125] On the other hand, the cost of natural resource depletion is viewed only from a national perspective. But there is a potential problem with this view. For example, Japan does not deplete its own natural resources on a grand scale; it has managed to offload many of the environmental costs associated with the growth of its economy onto other countries (see Makino 2008:185). An open economy GPI for Japan is thus required, i.e. an estimate of the environmental costs linked to all non-renewable resource imports, and all timber and food imports that have caused agricultural land to be lost in the originating country. The boundaries for the GPI are national as the indicator refers to the welfare of a particular society delineated by geographic boundaries. Yet, the book is the first attempt to be regionally based and less nationalistic. Featuring a dynamic and regional assessment of sustainable socioeconomic welfare is a major advance in the literature of SEWIs.

In addition, the writers strive for a more thorough assessment of GPI. An analysis of GDP is not left behind as much as it used to be (rather than ignoring it completely). In general, the authors actually examine some institutions, particularly with reference to the costs of unemployment, underemployment, and family breakdown. There are some good historical stories about ecological *and* social aspects, even some analyses of the economic growth phases. For example, in the Chinese GPI study, the authors divide the entire study period (1970–2005) into five key development periods (see Wen *et al.* 2008:250-6). Indeed, most of the authors divide the periods into distinct time periods and then actually provide a social-historical institutional analysis, which is a great improvement over previous works and is admirable. The authors are interested in history. Lawn (for the first time) is very interested about institutions *and* the business cycle to some extent (see Lawn 2008a:93-5). There are good analyses of GDP and linkages to institutions (e.g. see Forgie *et al.* 2008:127-9). In short, the bulk of authors go to great lengths to provide in-depth historical specificity, and the majority of the studies do not simply ignore GDP, and the linkage between GDP and GPI. Overall, there is a greater attempt to provide a better socio-historical institutional analysis.

It is also good to see that the authors are not as obsessed with the 'increasing gap between GDP and GPI'. It is revitalising that, in general,

[125] For example, some studies try to view the cost of CO_2 emissions from a global perspective by assigning the entire cost to the emitting country.

the authors have evaluated the differences between GDP and GPI and then explained them with a historical institutional analysis. However, the case studies would benefit from much more specificity by examining *in more detail* the trends of GDP per capita and GPI per capita over real historical time. As the main argument unfolds in this chapter, it is critical to examine the empirical trends of GDP and GPI/ISEW growth rates with a fine toothcomb, breaking down patterns of growth and development into periodic epochs. In other words, the *rigour of analysis* between GDP and GPI growth rates is rather weak. It is a shame that we could not include these works in our discussions/critical analyses, as on face value this volume is probably the most solid *empirical* (but not theoretical) contribution in the literature on SEWIs.

4.6 Subnational GPIs and ISEWs

Up to now, we have examined the ISEW/GPI studies at the country level only. Yet, when evaluating well-being with socioeconomic and environmental indicators, it can be just as valuable to appraise the level of welfare at the subnational level, which is the unit of study for this section. Wish (1986:97) argues that the unit of study is important, "since the quality-of-life differs within nations, regions, and states probably as much as it differs among them, any aggregate statistic that largely obliterates these differences is of questionable validity". It is possible to construct an ISEW or GPI at the subnational or subregional level of analysis, beginning with the Albertan (Canada) GPI in *Section 4.6.1* below:

4.6.1 Albertan GPI

Anielski, Mark (2001) The Alberta GPI Blueprint. The Genuine Progress Indicator (GPI) Sustainable Well-Being Accounting System, Pembina Institute.

The Alberta GPI Blueprint by Mark Anielski at the Pembina Institute is an advanced sustainability accounting system.[126] His major work describes the rationale, structure and methods used in constructing a Genuine Progress Indicator "system of sustainable well-being accounts":

> After more than 30 years of debate about how to live with "sustainable development", we still lack a conceptual and pragmatic analytical framework for managing living and

[126] In a similar vein, the Nova Scotia GPI project (www.gpiatlantic.org) is a sophisticated wealth–welfare measurement system, with a sectoral approach and an emphasis on policy relevance. But their primary intention is to do away with a single conglomerate monetary measure of sustainable well-being (akin to ISEW, GPI etc.). For instance, their figures can be gender-disaggregated. Hence, the Nova Scotia 'GPI' project is not strictly a net welfare indicator and therefore is excluded from our analysis because our focus is on typical SEWIs. Besides, only key points and press statements about the various sectoral accounts appear on their website, and the full reports need to be purchased. The Pembina Institute provides its reports free of charge.

> produced capital with a view to its physical conditions. This is partly because we are fixated on monetary expressions of what we falsely call "wealth". We need a new accounting framework for managing the real physical or qualitative conditions of wealth in its original context—the conditions of well-being. [Anielski 2001:4]

According to Anielski, wealth is defined as the "condition of well-being" associated with human, social, natural, produced and financial capital. The Genuine Progress Indicator accounts include: a) physical inventory of stocks/flows of the five forms of capital; b) monetary accounts (full costs and benefits) of the capital stocks and flows, using market values where relevant; and c) genuine progress indicators derived from either the physical inventory or monetary data in the total capital accounts (see Anielski 2001:20). It is not necessary that all components should have a financial value. Thus, constructing a monetary GPI is not the raison d'être; qualitative measures of the "conditions of well-being" are also important for the sustainability accounts. Unlike other ISEW/GPI advocates, it is good to see that Anielski is not preoccupied with the gap between GDP and GPI; rather he wants to transcend pecuniary-based measures of wealth.

Nonetheless, the monetary net income index (GPI) is still an important part of the sustainability accounting system. However, the author does not provide a fully-fledged account of the linkage between sustainable development and the conditions of well-being. His work is really a scheme of reports, where the most important thing is *compiling* the statistics to give an indication (qualitative or quantitative) of "genuine progress". As a result, no real theoretical foundation for the monetary-based GPI is presented. The mechanics behind the Albertan GPI are based on the methodological tools outlined in Anielski and Rowe (1999) at *Redefining Progress*—i.e. the commonsensical operational procedure.

Anielski (2001) has constructed a GPI (with debt costs) for Alberta, a province in Canada, but there is no national Canadian GPI to allow for a comparison. Except during the 1970s, on average the growth in real GPI per capita exceeded the GDP for Alberta over the most part of the 1961 to 1999 period, as shown in *Figure 4.19* and *Table 4.19* on page 185.[127] This brings into question the legitimacy of the ISEW/GPI to give promise to a 'threshold hypothesis' because of the exemplar of Alberta's amazing socioeconomic and environmental progress in the 1980s and 1990s.

[127] Note that the time-series of the Albertan GPI accounts have been updated, 1961–2003 (see Taylor 2005), but the *Pembina Institute* has not published their raw data columns of the monetary GPI. Hence, we could not include them in our analysis.

Figure 4.19. Albertan GDP and GPI, 1961–1999

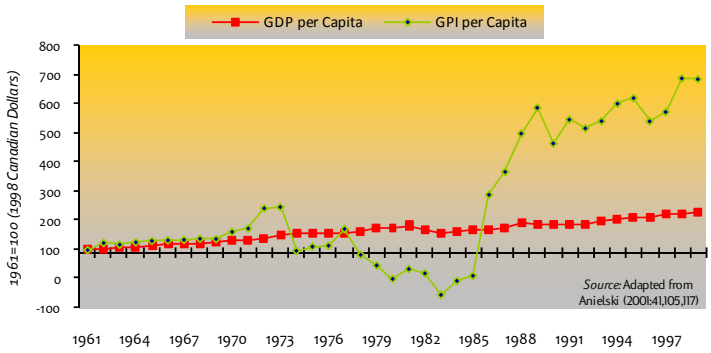
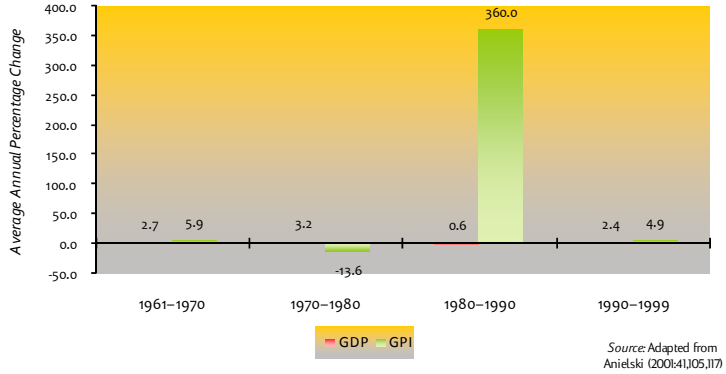


Table 4.19. Albertan GPI and GDP (per Capita Real Growth Rates), 1961–1999



As cited by the author, there were some noteworthy reasons why the growth trend in GPI per capita went beyond GDP: the Albertan GPI grew strongly through the 1960s; fell during the recessions of 1974–1975 and 1980–1983, and recovered extremely well during 1985–1989 as the significance of oil and gas weakened in the Albertan economy, and from 1986–1999 the value of unpaid work rose considerably which also explained the overall rise in the GPI for that period.

However, if GDP is used as a measure of material well-being then the average Albertan has fared quite well over the 1960s, 1970s and 1990s, notwithstanding the rather grim (low-growth) episode of the 1980s. But regardless of whether or not GDP provides a good measure of welfare, the author is disinterested in *how GDP explains real system processes*—e.g. the dismal growth rates of GDP per capita in the 1980s are completely ignored from the analysis. Nevertheless, he does provide a comprehensive institutional analysis of the *individual* components of the monetary GPI.[128] This is a good thing, and highlights that the bona fide worth of a disaggregated account (not in a combined index). But the effectiveness of the disaggregated account is reduced somewhat in *The Alberta GPI Blueprint*, as no conceptual basis is specified to guide the

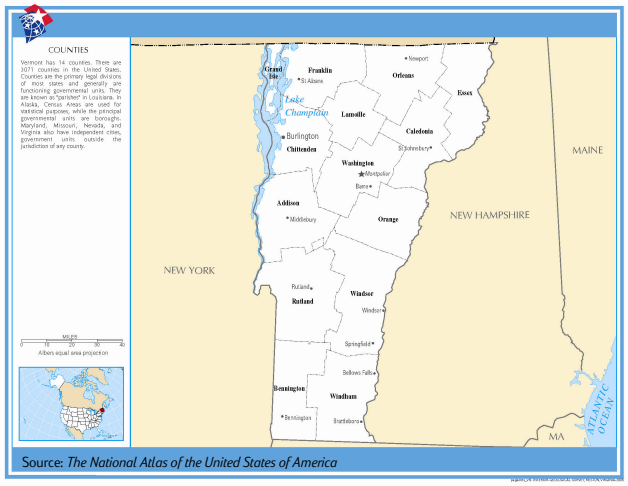
[128] For example, fifty-one indicators that form the Alberta GPI accounts have been individually published by the *Pembina Institute*, see http://www.fiscallygreen.ca/gpi/indicators.php.

study.

4.6.2 Subnational US GPIs: Burlington, Chittenden County, and Vermont

Costanza, Robert, Jon Ericksona, Karen Fligger, Alan Adams, Christian Adams, Ben Altschuler, Stephanie Balter, Brendan Fisher, Jessica Hike, Joe Kelly, Tyson Kerr, Megan McCauley, Keith Montone, Michael Rauch, Kendra Schmiedeskamp, Dan Saxton, Lauren Sparacino, Walter Tusinski and Laurel Williams (2004) "Estimates of the Genuine Progress Indicator (GPI) for Vermont Chittenden County and Burlington, from 1950 to 2000", *Ecological Economics*, vol. 51, pp. 139-155.

Bagstad, Kenneth J. and Marta Ceroni (2007) "Opportunities and Challenges in Applying the Genuine Progress Indicator/Index of Sustainable Economic Welfare at Local Scales", *International Journal of Environment, Workplace and Employment*, vol. 3 (2), pp. 132-153.



In the US, Costanza *et al*. (2004) constructed several GPIs at multiple subnational levels (the city, county and state), and have shown that it is possible to compare the indices with the national average. They are attracted to the explanatory power of a comparative study between the GPIs. But they are not concerned with comparing and contrasting GDPs and GPIs *per se*. This paper is an important contribution because the GPI has been estimated at various scales for the US. The authors have followed closely the methodological framework as set out by Anielski and Rowe (1999) to estimate three GPIs for six decades over the 1950–2000 period for the state of Vermont, Chittenden County (the county with the largest population in the state), and Burlington (the largest city in Chittenden County) (see map attached).

The subnational scales of the GPI per capita for Burlington, Chittenden and Vermont were significantly higher than the US national GPI since the 1980s, as shown in *Figure 4.20* and *Table 4.20* on page 187. The trend of GPIs in Vermont, Chittenden County and Burlington were better than the national-level US GPI, because Vermont had a greener policy stance during the 1980s–1990s, e.g. hydro-electricity generation (Costanza *et al*. 2004:149). In contrast, the US was reliant on fossil fuels for power generation. This study highlights the usefulness of the comparative analysis between GPIs at national and subnational levels.

Figure 4.20. Burlington, Chittenden County, Vermont and US per Capita GPIs, 1950–2000 (decennial years)

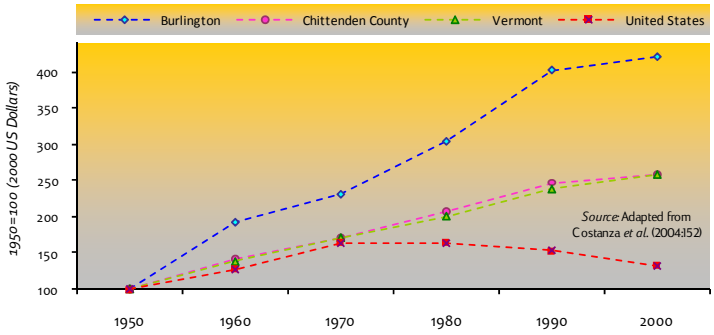
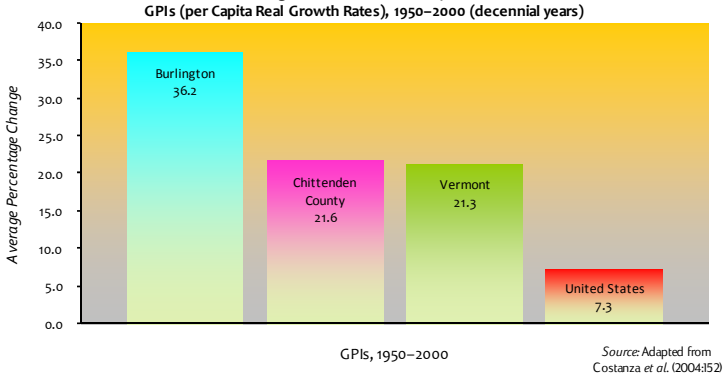


Table 4.20. Burlington, Chittenden County, Vermont and US GPIs (per Capita Real Growth Rates), 1950–2000 (decennial years)



Furthermore, it is positive that the authors recognise that interregional flows of non-marketed goods and services (i.e. ecosystem services) are not captured in either the GPI or GDP. This is the first time in which ISEW/GPI advocates have noted the issue of transboundary pollution. For example, while Vermont may be benefiting from a better local environment, this may be at least partly at the expense of a depleted environment elsewhere in the country or the world. But, the authors say that even if incorporating some quantification of these transboundary effects would improve the GPI, it seems unlikely that this effect would explain the vast differences between Vermont's GPI and the GPI for the US.

The authors show there are limitations to direct monetary comparisons between countries. A challenge for a comparative view of GPI is gathering the necessary expenditure and depreciation cost data to complete the net income index. In their multi-level inquiry, they encountered many measurement problems and found that data availability for GPI components decreased with a decreasing geographical scale. GPI relies heavily on available statistical sources and data. Often these secondary data sources and statistics are not available, and if they are they are only available for particular points in time, and

not over the whole period—a common problem for ISEW/GPI studies. "In lieu of local data, some of the columns were based on national or state figures scaled down to the local level using ratios of various kinds. This method obviously does not fully capture the unique qualities present at the smaller scales" (Costanza *et al.* 2004:149). The authors suggest that some of these problems for calculating environmental and social costs can be rectified via alternative methods, such as the use of the social survey (Costanza *et al.* 2004:149,152-4). In other words, we may be able to identify various regrettable social and environmental costs in the country/state/city, *yet we are not able to calculate them*.

Their exercise has alerted them to the major data limitations of the subnational scales (see Costanza *et al.* 2004:153-4). They have begun to think about how to improve both the data and the index by offering the following suggestions, where future work will focus: (1) improving the database for GPI at the city, county and state scale, including estimates of between-census years starting with the 1990s; (2) systemising the calculations so that GPI can more easily be applied to other cities, counties and states across the country to allow comparisons at these scales; and (3) comparing GPI and revised indicators with survey data to help understand how monetary-based indicators like GPI relate to people's subjective rankings of quality of life. Thus, GPI is valuable provided "measurement" problems are solved. Yet, they made no comments or criticisms of the theoretical foundation of the GPI (or lack thereof). At least the authors provided a reasonably good comparative study, and identified several other non-conceptual problems, which were innovative.

N.B. Following in the steps of Costanza *et al.* (2004), Bagstad and Ceroni (2007) calculated GPIs for the decennial years 1950–2000, for the six Northern Forest counties in Vermont (Caledonia, Essex, Franklin, Lamoille, Orleans and Washington). These counties are characterised by abundant forest cover, a settlement pattern of small New England town centres, and a low population density. Bagstad and Ceroni (2007) have replicated the Costanza *et al.* (2004) study completely. The paper by Bagstad and Ceroni (2007) is the first local GPI calculation for a US rural area, which successfully shows that GPI can identify components (parameters of the GPI) where a region is performing more strongly than nearby regions or the national average. However, due to not having full access to the content of this difficult-to-find journal in time for my thesis completion, it cannot be subjected to a full critical analysis in this chapter and the next.

4.6.3 Victorian GPI

Clarke, Matthew and Philip A. Lawn (2005) "Measuring Victoria's Genuine Progress – A Genuine Progress Indicator For Victoria", *Economic Papers*, vol. 24 (4), pp. 368-389.

Lawn, Philip A. and Matthew Clarke (2006a) "Comparing Victoria's Genuine Progress with that of the Rest-of-Australia", *Journal of Economic and Social Policy*, vol. 10 (2), pp. 115-138.

Lawn, Philip A. and Matthew Clarke (2006b) *Measuring Genuine Progress: An Application of the Genuine Progress Indicator*, New York: Nova Science Publishers, Inc.

The authors aim to reveal the extent to which the sustainable well-being of the average Victorian has advanced over the study period (1986–2003). The authors also try to comprehend the factors behind the trend movement in Victoria's GPI and the link between GPI and the growth rate of the Victorian economy. We have already discussed the methodological advances that they made in *Section 4.5.3* above. Any new ideas made vis-à-vis the empirics of the Victorian economy are discussed in this section.

Lawn and Clarke (2006a, 2006b) look at the performance of Victoria in relation to the "Rest-of-Australia", which is done via a simple and minor change, by subtracting the Victorian GPI from the Australian GPI. They find that the trend movement in GPI per capita was much the same for both Victoria and the Rest-of-Australia. However, there was a notable widening of the gap between the GPI of Victoria and that of the Rest-of-Australia towards the end period of the study, 1997–2003. The difference between Victoria and the Rest-of-Australia was greatest in relation to the various environmental cost items, such as the 'non-renewable resource depletion' and the 'lost agricultural land' components of the GPI (see Lawn and Clarke 2006b:74-5). Victoria is much less reliant on mining proceeds as a means of financing its consumption of goods and services. They argue this suggests Victoria is better able to operate within its biophysical means by generating a significantly larger fraction of genuine money income from value-adding activities compared to other states such as Western Australia and Queensland. The rate of native vegetation clearance was also much lower over the entire study period for Victoria than the Rest-of-Australia (especially the reckless vegetation clearance in Queensland). Indeed, the lower per capita cost of lost agricultural land in Victoria was a very strong dynamic that explained the disparity between the GPIs of Victorian and Rest-of-Australia. Victoria does not need to rely as intensely on the depletion of natural capital assets to finance its consumption endeavour compared to the Rest-of-Australia. The authors seem to have more stimulating discussions on the subnational performance of sustainable well-being than their national GPI study.

Additionally, the authors link policy to the various components that have declined over the period.[129] For example, the "cost of long-term environmental damage" is relatively lower in the Rest-of-Australia; this implies that Victoria has failed to find better and cleaner ways of using energy. "Increased energy efficiency and the transition towards renewable energy sources clearly requires greater policy emphasis if Victoria is to reduce its per capita energy consumption and bridge the cost gap

[129] The authors put forward some excellent policy prescriptions; see chapter 6, "Policy Implications of the GPI Results" in *Measuring Genuine Progress: An Application of the Genuine Progress Indicator*.

between itself and the Rest-of-Australia" (Lawn and Clarke 2006a:130). They provide a relatively good context-specific analysis of the GPI trends (e.g. see Lawn and Clarke 2006a:120-36). For instance, they find that Victoria's cost of excessive irrigation water use was both large and persistently on the rise throughout the study period (e.g. $3,863 million in 1986 and $5,827 million in 2003). This is because the state of Victoria relies heavily on the Murray-Darling Basin for is agricultural output. Unfortunately, they have a relatively limited social analysis, which was also a problem in their Australian GPI study. But overall, the authors had a fabulous eco-historical comparative analysis of the *disaggregated account* of the GPIs for Victoria and the Rest-of-Australia.

In their aggregated inquiry, they aim to link the trend of GPI to GDP and net capital investment (NCI). They argue that high rates of growth have failed to translate effectively into sustainable well-being for the average Victorian. Victorian GPI rose moderately over the 1986–2003 period. Similarly to their Australian GPI study, evidence for Victoria suggests that beyond 1993 GPI per capita did not accelerate in the same manner as per capita real GDP and NCI, as shown in *Figures 4.21a,b* and *Tables 4.21a,b* below:

Figure 4.21a. Victorian Net Capital Investment (NCI) and GPI, 1986–2003

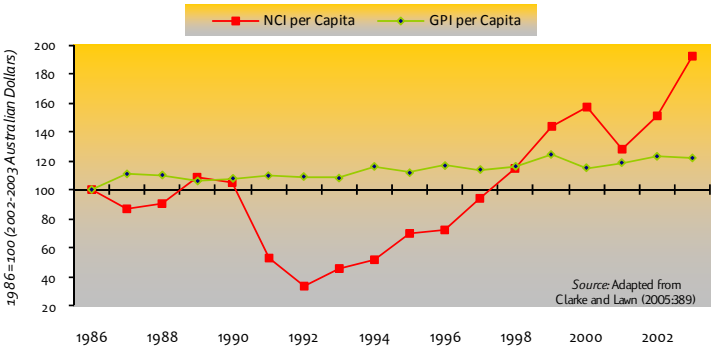


Table 4.21a. Victorian NCI and GPI (per Capita Real Growth Rates), 1986–2003

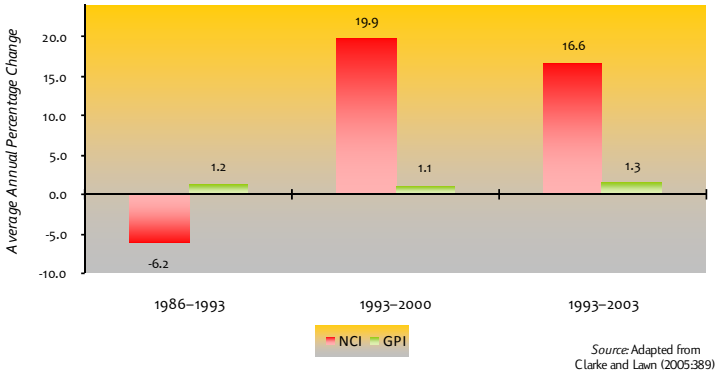


Figure 4.21b. Victorian GSP and GPI, 1986–2003

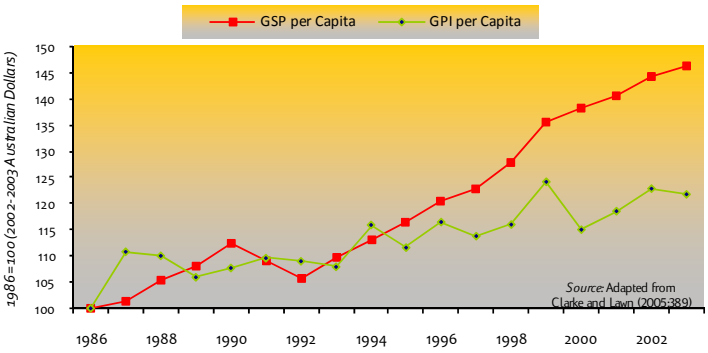
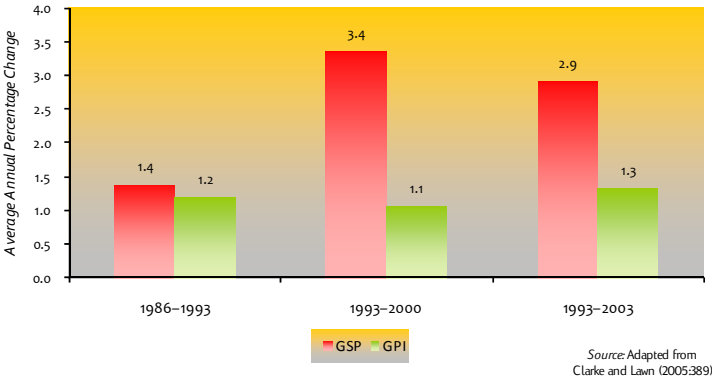


Table 4.21b. Victorian GSP and GPI (per Capita Real Growth Rates), 1986–2003

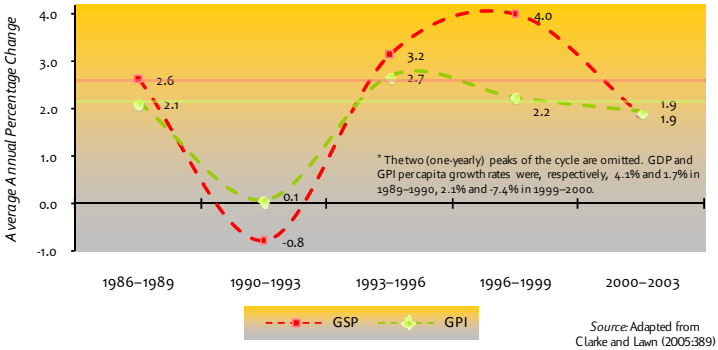


The main difference between the Australian and Victorian GPI was the higher growth rates of GDP and NCI per capita over 1993–2003. A considerable proportion of GPI upsurge was due to an increase in consumption-related welfare, especially since 1997. Again, the authors have a very good analysis of the *component items of the GPI*: why its general rise did not begin until after 1993; and why the rise in the GPI per capita was disappointing when compared to the rate of economic growth (e.g. see Clarke and Lawn 2005). The results would appear to support their major conclusion that "a lower rate of growth is beneficial to sustainable well-being" (Lawn and Clarke 2006a:133, b:80). But, their disaggregated study is far better than the aggregated account. Besides, they are not interested in real socioeconomic processes of capitalist development and demise.

On the surface, they appear to do a very good job at scrutinising GPI trends with the ratio of net capital investment. While the authors look to critically evaluate the socioeconomic and environmental position of the Victorian economy, they are merely interested in 'various changes between periods' (a problem also eminent in their Australian GPI study). The Victorian instability should be examined in a more systematic fashion: the boom (1986–1990); recession (1990–1993); upswing (1993–1996); boom (1996–1999) and downswing (2000–2003). Their

presumption that GDP growth is detrimental to "genuine progress" falters when we scrutinise the Juglar cycle over 1986–2003, as shown in *Figure 4.21c* below: [130]

Figure 4.21c. Juglar Cycle: Victorian GDP and GPI (per Capita Real Growth Rates), 1986–2003*



Source: Adapted from Clarke and Lawn (2005:389)

In the figure above, GPI growth is less volatile than GDP growth—but they both follow the same general cyclical pattern (i.e. the same periodicity). During the upswing/boom times of 1986–1989 and 1993–1999, real growth of GDP per capita was high (2.6% and above), and real growth of GPI per capita was relatively medium-high (2.1% and above). It is also the case during the recession of 1990–1993 and the downswing of 2000–2003, when the average growth rates of GDP and GPI are less than 2.6% and 2.1% per annum, respectively. The authors said, "we have conducted a very comprehensive assessment of Victoria's genuine progress performance" (Lawn and Clarke 2006b:65). Yet, their analyses of the business cycles of capitalism at both the national and subnational level have been insubstantial.

4.6.4 Province of Siena, Italian ISEW

Pulselli, Federico Maria, Francesca Ciampalini, Enzo Tiezzi and Carlo Zappia (2006) "The Index of Sustainable Economic Welfare (ISEW) for a Local Authority: A Case Study in Italy", *Ecological Economics*, vol. 60, pp. 271-281.

Another significant study undertaken at the subnational level was Pulselli *et al.* (2006) which compared Siena's local experience with the national Italian economy (see Guenno and Tiezzi 1998). This is the first study for the ISEW calculated at the local level for the Province of Siena, located in Tuscany, central Italy. Siena is the second largest Province in Tuscany and is composed of 36 municipalities with a total population of 252,972

[130] To ensure some sort of consistency and comparability over the 1986–2003 period, the business cycle is divided into five distinct 'three-year' cycles. However, we have deliberately left out the 1989–1990 and 1999–2000 figures of the average annual percentage changes in GDP per capita and GPI in *Figure 4.21c*. These two periods are at the *peak* of the boom. If we included these peak periods, then the results would alter the depiction of the business cycle, but only over the 1999–2000 period, where GPI per capita fell by 7.4% and GDP per capita grew by 1.6%. Thus, we submit that our critique is somewhat debatable.

(in 1999). The Province's main economic activities are linked to tourism, trade, banking and agriculture; the level of industrial activity is low, except in the crystal, building materials and furniture sectors. The main commercial products are food including regional specialities such as wine (Brunello di Montalcino, Chianti, Vino Nobile di Montepulciano and Vernaccia di San Gimignano), cheese (pecorino di Pienza) and olive oil. Four UNESCO World Heritage sites are in the Province of Siena: the Historic Centres of San Gimignano, Siena, and Pienza; and Val d'Orcia. "They are much more than tourist attractions because they call for a special policy to preserve and sustain their natural and historical integrity" (Pulselli *et al.* 2006:273). It is exciting to read that the authors are passionate about the history, culture and socio-ecological character of their place of residence.

The authors have an eclectic approach to finding the most suitable methods/procedures for calculating the sustainable economic welfare index. They are consistent with Leipert (1986), Daly and Cobb (1989) and Stockhammer *et al.* (1997) in constructing an adjusted measure of GDP. In their work, "[w]elfare is affected by the flow of services to humankind rather than by the current output of marketable goods and services (England [2001])" (Pulselli *et al.* 2006:272). However, no concrete theory is offered. In addition, the authors realise that the ISEW is imperfect, referring to *some* of Neumayer's (1999, 2000) "methodological contradictions".

The methodology used in their paper is consistent with Guenno and Tiezzi (1998). Some exceptions relate to the public maintenance costs of urban development, water distribution, and urban health. Urbanization costs were not subtracted, because the authors argue they are directly related (positive) to welfare in Siena. In addition, local advertising plays an important social role by broadcasting information that is (potentially) unbeneficial for collective welfare. Hence, a portion of local advertising costs should be subtracted; yet, since no data on local advertising costs were available, this item was omitted.

Unfortunately, their results cannot be directly compared with Guenno and Tiezzi's (1998) Italian ISEW because of the different periods. The Sienan ISEW is only calculated for a single year, 1999 (Pulselli *et al.* 2006), whereas the Italian ISEW is for the whole 1960–1990 period. All monetary values were expressed in Italian Lira (1999), and then converted into Euro by multiplying by the fixed exchange rate of 1936.27 Lira per Euro, as shown below:

ISEW per Capita for Siena (1999): 11,231 Italian Lira
GDP per Capita for Siena (1999): 17,822 Italian Lira

The ISEW per capita/GDP per capita ratio is equal to 63%; thus, the gap difference is about 37%. While the authors stress the importance of the

large gap between the Sienan GDP and ISEW, it is not really the focal point of their paper.

There are several important conclusions about the level of sustainable economic welfare in Siena versus Italy. The main differences concern pollution and exhaustible resources. The low impact of air, water and noise pollution in the Province of Siena reflects the characteristics of the area, where economic production is in the sectors of agriculture, tourism, services, etc. rather than the industrial sectors. In addition, the towns in Siena are small and population density is small. However, exploitation of non-renewable resources is a typical activity of the local area due to quarrying of ornamental stone, gravel and sand for construction. The authors argue that a substantial increase in the production inputs of energy and non-renewable resources greatly affected the level of net income in Siena. The scattered presence of industrial activities and the low population density in the Province of Siena make the effect of pollution smaller than Italy as a whole. Energy and resource consumption as well as the exploitation of local stocks of non-renewable resources are substantial inputs and greatly affect the results (see Pulselli *et al.* 2006:279). We are impressed by the care given to the environmental-historical analysis.

The authors conclude that "the Province of Siena is already beyond the "threshold" (Max-Neef 1995), though with a prosperous economy based on the tertiary sector and good environmental conditions due to the absence of invasive urbanism and heavy industry" (see Pulselli *et al.* 2006:279). But, they overlook Neumayer's (1999, 2000) critique that the 'threshold limit' may be synthetic—as a result of a mechanical tweaking of the variables in the ISEW. Authors rightly advocate the vital importance of having multidimensional indicators that reflect the links between the economy, environment and society:

> The use of this holistic indicator demonstrates that a set of good economic indicators and good environmental status are not sufficient for sustainability of human activity, if applied separately. ... Sustainability indicators should go beyond the reductionist approach with its separate compartments of environment, economy and society and reflect the interactions between them. [Pulselli *et al.* 2006:279]

Their conclusions in this statement are problematic. As we argued in *Chapter 3*, the ISEW evidently cannot handle concrete reality; it is in itself reductionist because it does not the link the spheres of ecology, economy and society to a specific socioeconomic system (e.g. the disembedded economy). Nevertheless, it is a refreshing change to see that the authors

did present a sophisticated analysis of real socio-historical processes.

4.6.5 Yorkshire and Humber, Northern Way, and UK ISEWs

Jackson, Tim, Nat McBride and Nic Marks (2006) *An Index of Sustainable Economic Well-being*, London: New Economics Foundation.

Jackson *et al.* (2006) develop a pilot indicator of "sustainable economic well-being" for the Yorkshire and Humber region and the Northern Way region in the United Kingdom. Specifically, they construct two regional ISEWs and one country ISEW for the United Kingdom. The aim of their study was to develop an economic indicator that could be implemented as one of the headline indicators of progress by the Yorkshire and Humber region.

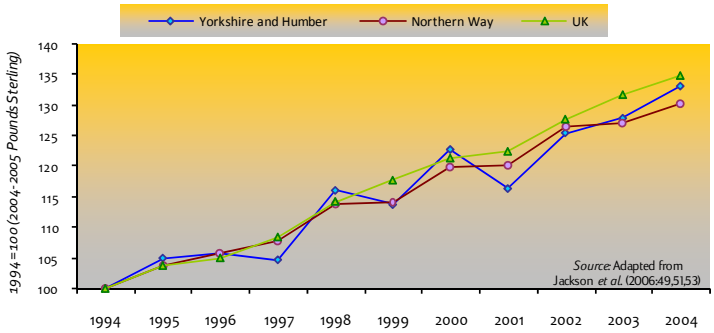
The basis for the indicator is simply a regional variation of the adjusted economic indicator developed by Daly and Cobb (1989). They propose a so-called Regional Index of Sustainable Economic Well-Being (R-ISEW) which incorporates various "economic", "social" and "environmental" adjustments. No specific theory is provided and the authors ignore Daly and Cobb's persons-in-community model. Compared to the original US ISEW by Cobb (1989, 1994), Jackson *et al.* (2006) include some additional variables in their R-ISEWs and UK ISEW, such as volunteer labour and costs of divorce (family breakdown) (which are familiar to the GPIs). They also change a few of their measurement techniques. They do not deduct the defensive education and health costs from personal consumption expenditures, as they believe all public expenditures on health and education are a social benefit. Instead, they account for the health-related costs directly related to the environmental and social factors in the index. Additionally, the authors are the first to include an adjustment for any "environmental benefits" that have been attributable to good policy-making, e.g. the Yorkshire and Humber region has attempted to compensate for the effects of climate change through carbon sequestrations. Overall, the authors have made only minor technical advancements to the ISEW/GPI literature.

However, the authors develop a new methodology by addressing the question of long-term ecological debt. That is, they want to account for the accumulated and present actions of a deferred ecological debt. Their method treats the current accumulated debt as though it might be paid off over time through an annuitized endowment fund that matures when required in the future. "Regular payments into this fund over the next 50 years (say) will be sufficient to pay off the debt provided that we start making the payments today. Should we fail to pay the premiums this year, however, the time available to achieve the required sum at payout will shorten and next year's required payments will therefore be higher" (Jackson *et al.* 2006:19). They argue that this method is effective because it avoids the "huge adjustments" required to reflect the entire discounted value of estimated future costs within current accounts. The endowment

premiums attributable to a Yorkshire and Humber climate change fund from 1994 to 2004 increased by 35%. The escalating atmospheric carbon causing damage is more prevalent in Yorkshire and Humber than for many other areas in the UK because of the high density of fossil fuel power plants and energy-intensive industry. The impact of this accounting procedure is significant; nevertheless, it does not overwhelm the aggregated measure (the ISEW).

Their results portray a steady increase in the Yorkshire and Humber R-ISEW, Northern Way R-ISEW and UK ISEW per capita between 1994 and 2004, as can be seen in *Figure 4.22* below:

Figure 4.22. Yorkshire and Humber Region, Northern Way Region and UK per Capita ISEWs, 1994–2004



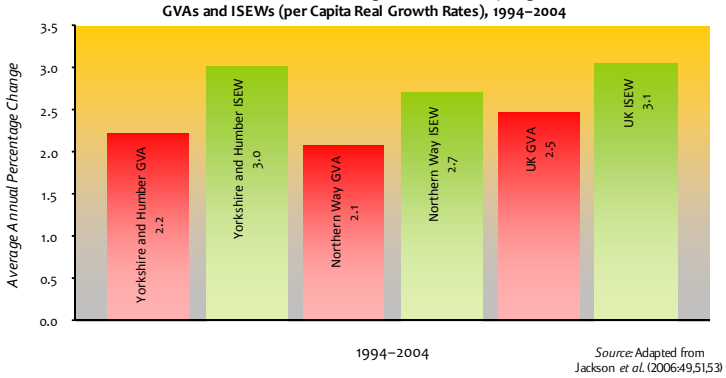
The increase in the R-ISEWs and the UK ISEW is primarily driven by strong consumption growth, increased business investment, rising expenditures on public health and education, and considerable reductions in local air pollution. However, there are regional differences between the subnational trends and national trend. But the authors only want to converse on the *absolute* variation between the national ISEW and R-ISEWs. For instance, consider the reduction of air pollution, the largest single environmental component contributing to an increase in the ISEWs. In Yorkshire and the Humber, the per capita cost of air pollution in 1994 was £1,244, 50% higher than the UK average of £832. By 2004, the per capita cost of air pollution in Yorkshire and Humber had fallen to £561, which is still 46% higher than the average cost per UK citizen of £384. This represents a much greater absolute reduction, and considerably closes the gap between region and nation. The Yorkshire and Humber region achieved significant reductions of emissions per unit of production because of the tighter regulations on emissions and improvements in technology. In comparison to the Northern Way region as a whole, the costs begin and end higher for Yorkshire and Humber due to the high levels of heavy industry and power generation. The authors argue that this progress in the Yorkshire and Humber region should nevertheless be considered in the light of a considerably lower

starting position in the R-ISEW.

Yet, the authors are obsessed with the variance of absolute monetary values.[131] Of course, this is not a serious problem because the comparative analysis between the multiple *ISEW values* offers an intriguing perspective of the historicity of the performance in Yorkshire and Humber, Northern Way, and UK. The authors excel in this area. However, a comparative analysis of the absolute values between GDP (or gross value added, GVA) *and* the ISEW is problematic, because GDP was designed as a measure of economic activity or *output*, whereas the ISEW purports to measure sustainable economic *welfare*. The indicators are two very different monetary-based measures, and only trend-based comparisons are useful.

The major problem is that they underplay the real trend situation: of higher average annual growth rates of ISEW per capita relative to the lower growth rates of GVA per capita over the 1994–2004 period, as shown in *Table 4.22* below:

Table 4.22. Yorkshire and Humber Region, Northern Way Region and UK GVAs and ISEWs (per Capita Real Growth Rates), 1994–2004



Source: Adapted from Jackson *et al.* (2006:49,51,53)

Jackson *et al.* (2006) completely downplay their empirical results: that the ISEWs grew much faster than the GVAs for all areas over the 1994–2004 period. They are simply not interested in the relative growth trends between GVAs and ISEWs—no socio-institutional account of these remarkable results in *Table 4.22* is provided. Their results are notable because GVA growth per capita (especially in the UK) appears to be *benefiting* the real growth of sustainable economic welfare, which could be the case. After a relatively disembedded period of Thatcherism in the late 1970s and 1980s and a deep recession of the early 1990s, the expansionary 1994–2004 era in Britain most likely characterises the slightly less disembedded policies of the Blair–Labor government. It must be noted that Jackson *et al.* (2006) is a pilot study. Yet it seems

[131] Atkinson (1995:5, emphasis added) argues that "it is not the absolute terms that are important but the size of the adjustment relative to that of conventionally defined income[,] ... [i.e.] *changes in the value of* ... welfare ... or GNP".

strange that they do not want to specify whether the 'threshold hypothesis' has been reached or not.

4.6.6 Belgian ISEWs

Bleys, Brent (2006a) *The Index of Sustainable Economic Welfare Case Study for Belgium: First Attempt and Preliminary Results*, Brussels, Belgium: Vrije Universiteit Brussel.

Bleys, Brent (2006b) *The Index of Sustainable Economic Welfare for Belgium. Data, Methodology and Preliminary Results*, Brussels, Belgium: Department MOSI – Vrije Universiteit Brussel, Report MOSI/27.

Bleys, Brent (2008) "Proposed Changes to the Index of Sustainable Economic Welfare: An Application to Belgium", *Ecological Economics*, vol. 64, pp. 741-751.

Brent Bleys (2006a, 2006b) from Vrije Universiteit Brussel constructs a preliminary ISEW for Belgium for the 1971–1999 period. He considers it is only a first attempt to measure sustainable economic welfare in Belgium, and realises that there are some important caveats to his study. In a more recent study, Bleys (2008) modifies the original Belgian ISEW to some extent and extends the time-series analysis for the 1970–2004 period. He contributes to the discussion by proposing that there are changes required to the existing ISEW framework.

In both studies, he suggests that supplementary indicator systems are vital for a full report on welfare, and that a single indicator such as GDP or the ISEW should by no means guide policy decisions (e.g. see Bleys 2008:750). In addition, he tends to agree with the methodological criticisms of Neumayer (1999, 2004)—that the ISEW cannot simultaneously function as both an indicator of current welfare and an indicator of sustainability; and that the index is not an indicator of strong sustainability, but one of weak sustainability. This is because the ISEW framework allows for perfect substitution among different types of capital. In essence, he argues that the ISEW is actually a measure of economic welfare, and *not* so much one of sustainability (see Bleys 2006a:76-81). The initial impression is that Bleys is up-to-date with the prevailing issues of the ISEW in the literature.

However, despite a lengthy inquiry into the issues, he offers no *new* theoretical foundation. Yet, he states that there *is* a theory for the ISEW. He agrees with Lawn (2003) that the ISEW has a good theoretical basis: Fisher's (1906) concept of income and capital. For example, he thinks that Fisher's definition of 'capital' has three elements: capital is a productive capacity; capital generates dividends for the future; and capital only includes factors that themselves have been produced in the economic system. In his view, therefore, a major part of this concept of income is the flow of services derived from all consumer goods (the 'psychic income') by final users after deducting the irksome activities (the psychic outgo). But, the setback is that he downplays the sustainable component of the ISEW in the theory of '*entropic* net psychic income', and disregards the other two theories identified in *Chapter 3* of economics for community and social choice.

His preliminary results of Belgian GDP per capita and the ISEW over

the 1971–1999 period does not appear to support the 'threshold hypothesis', as shown in *Figure 4.23* and *Tables 4.23a* below:

Figure 4.23. Belgian GDP and ISEW, 1971–1999

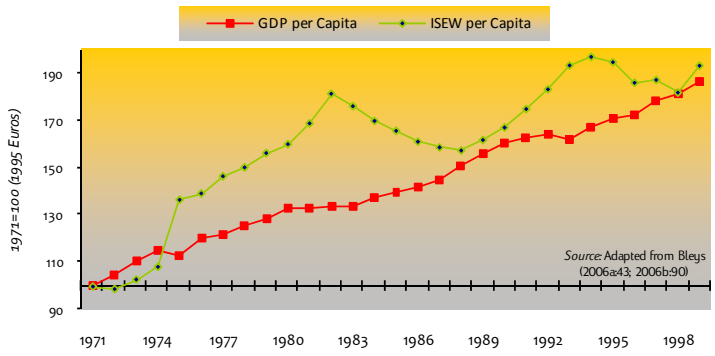
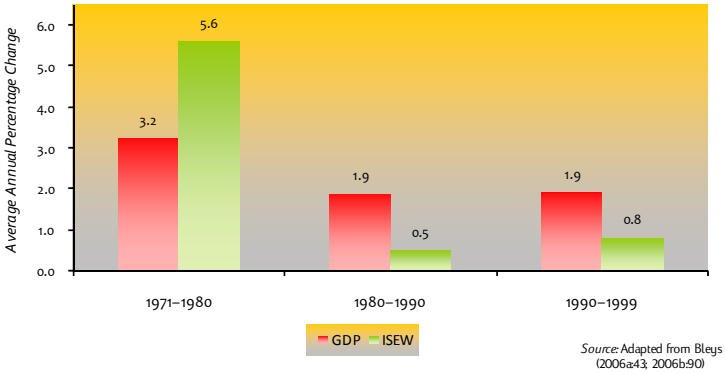


Table 4.23a. Belgian GDP and ISEW (per Capita Real Growth Rates), 1971–1999



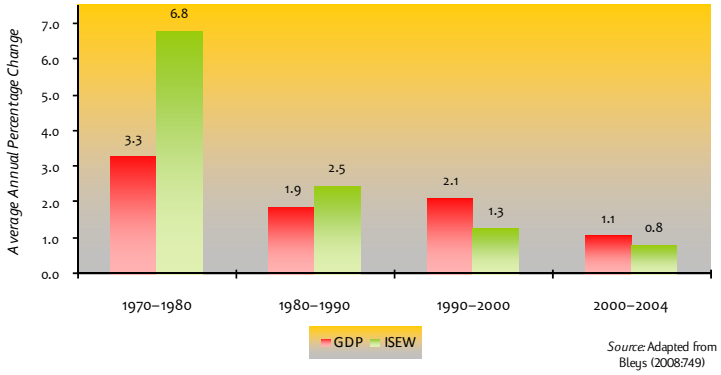
It is peculiar that in the 1970s the average annual growth rates of GDP per capita and ISEW per capita were *both high*, 3.2% and 5.6%, respectively. Also, in the 1980s and 1990s, the average annual growth rates of GDP per capita and ISEW per capita were *both low*, at 1.9% and 0.65%, respectively. This may indicate that high GDP growth per capita is conducive to sustainable economic welfare and low economic growth is not, as shown in *Table 4.23a* above. In this preliminary study for Belgium, the 'threshold hypothesis' turns out to be false.

On the other hand, the author realises that the economic welfare recession of the mid-1980s is largely caused by a decrease in 'net capital growth', which drops off significantly between 1983 and 1987. Other driving factors include the rapid increase of CFCs released into the atmosphere and that non-renewable energy use increased by 15% over this period of four years as well (i.e. rising costs of ozone layer depletion and natural capital depletion). In addition, the recent drop in the Belgian ISEW per capita can be mostly attributed to the decline in its net international investment position. That is, for small countries with a relatively open economy, such as Belgium, this item has a significant and

overwhelming impact on the overall evolution of the index.

Hence, Bleys (2008) omits two variables within the methodology of the ISEW, 'net capital growth', and the 'changes in the net international investment position', and also updates the valuation methods of four items (as discussed in more detail in *Chapter 5*). It will be interesting to see how these adjustments influence the overall trend of the indicator that supposedly measures social and environmental welfare. Regrettably, Bleys (2008) has not provided the raw time-series data used in the compilation of this 'revised' Belgian ISEW; he only provides the average annual percentage changes of real GDP per capita and ISEW. The results of the revised Belgian ISEW that incorporates the changes mentioned a GDP over the 1970–2004 period are presented in *Table 4.23b* below:

Table 4.23b. Belgian GDP and ISEW (per Capita Real Growth Rates), 1970–2004



Source: Adapted from Bleys (2008:749)

The results of the Belgian trends of GDP and ISEW in *Table 4.23b* are highly interesting but grossly unexamined; the author shows no real interest, and he has *no* socio-institutional apparatus (not even a weak one) because he is not cognisant of the real processes of the social economy. How was life for the average citizen of Belgium over the last 34 years or so? With respect to Bleys' (2008) study, we do not know. It is left up to the reader to examine the relationship between GDP and ISEW on their own accord.

It seems that the author has lost a lot of hope in the ISEW in its present form and past applications: given the high sensitivity of the results of any ISEW study to its underlying assumptions, he argues that it is imperative to state the assumptions clearly. Yet, unpacking all the arcane assumptions behind this single index is going to be very difficult. Hence, he warns against interpreting the results too literally (at least until a widely accepted and more robust set of valuation methods is established). The raison d'être of the compilation of an ISEW lies in its potential as a communication tool (Bleys 2006a:37)—"*the value of the whole exercise lies in its rationale* (economic growth and economic welfare do not necessarily go hand in hand) *and not so much in its empirical*

results" (Bleys 2008:750, emphases added). Why have detailed empirical studies of the ISEW been done in the first place? Bleys seems to be *both* an advocate *and* critic of ISEW, which in this case is a somewhat contradictory position because *the author is undermining the very measure he has constructed, studied empirically and published*.

4.6.7 Chinese Provinces, GPIs

Wen, Zongguo, Kunmin Zhang, Bin Du, Yadong Li and Wei Li (2007) "Case Study on the Use of Genuine Progress Indicator to Measure Urban Economic Welfare in China", *Ecological Economics*, vol. 63, pp. 463-475.

This is the first case study that used GPIs to evaluate the urban economic welfare progresses over the 1991–2001 period in China. Wen *et al.* (2007) study the welfare of the following urban/city areas in China: Suzhou and Yangzhou in Jiangsu province, Ningbo in Zhejiang province, and Guangzhou in Guangdong province. The authors do not provide a socio-historical overview of these Chinese cities, which makes it difficult for their readers. The goal of their study is to show that the GPI overcomes the deficiencies of GDP in measuring economic performance and well-being. But the authors are less focused on whether or not there are any "gaps between GDP and GPI"; in the main, they are more concerned with the specific components that comprise the GPI, especially environmental factors.

The authors slavishly follow the commonsensical operational method or as they call it, "the GPI approach", and as such, the authors make no theoretical advances:

> The GPI differentiates between what most people perceive as positive and negative economic transactions, and between the costs for producing economic benefits and the benefits themselves. ... [In essence,] [t]he GPI approach uses the consumer expenditures adjusted for income inequality as its base, then added or subtracted the values determined for all the components based on whether they enhance or lessen the human wellbeing, regardless of whether or not money changes hands. [Wen *et al.* 2007:464]

Hence, no theory is provided—the GPI is purely an 'approach'. In their study, they include over twenty "economic", "social" and "environmental" components that GDP ignores. In other words, their GPI is based entirely on a range of adjustments to personal consumption expenditures that seem natural and commonsensical.

At least these GPI advocates concede that there are some major weaknesses of the GPI. They say that a single measure cannot satisfactorily evaluate urban economic welfare because the scope is too

broad and subtle. They also state that even though factors such as family break-up, community services, and depletion of ecological capital have significant economic consequences, it is difficult to translate into monetary terms for the calculation of the GPI. "The GPI is developed as a measure of weak sustainability. It cannot be used for strong sustainability[.] ... The GPI alone cannot conclude whether an economic activity is more or less sustainable. Other supplementary approaches such as the Ecological Footprint (EF) are needed to determine what is happening to natural capital over time" (Wen *et al.* 2007:465). They say 'sustainability' is such a multi-faceted concept, and it is impossible for GPI to assess everything about it.

Nonetheless, in their study, the GPI components were divided into three categories: "economic sustainability", including nine components such as the services of consumer durables (cars and refrigerators), highways, and streets. The second apparently measures the "social sustainability", e.g. costs of divorce, crime, and non-monetary benefits such as the value of time spent on household work, parenting, and volunteer work. The third indicates "environmental sustainability" with ten cost items such as the depreciation of environmental and natural resources. The three types of "sustainability" are anomalous, given that the authors previously deride GPI for being a poor measure of sustainable development.

In their results, GDP and GPI growth were found to be divergent. Alas, we cannot illustrate their results for the GPI *and* GDP because they have not provided enough raw data but we can describe the general picture. In the four cities the gaps between GDP per capita and GPI per capita increasingly widened over the study period. According to the authors, this is indicating the depletion of non-renewable natural capital (rising fossil fuel use), rising pollution in the atmosphere through industrial and vehicle emissions, increasing traffic congestion and accidents; most of these factors are contributing to climate change. Consequently, the gap between GDP and GPI grew rapidly, reflecting worsening sustainability of local economic welfare.

The authors explain that the large social costs in these cities were primarily due to commuting costs resulting from outdated public infrastructure and from the problems of unemployment. However, for most values of "social sustainability", the authors merely report on the situation that it has gone either 'up' or 'down'. No specific historical context is provided. The authors are more engrossed in the ecological side of the GPI than the economic and social factors, but this is a trade-off they willingly took on. Their attention to environmental degradation is thus excellent. For example, they explore the increasing costs of wetland losses in the four cities in some detail. Despite the fact that the land coverage and the reserves of forests in Ningbo, Guangzhou, and

Yangzhou have been increasing continuously since the beginning of 1970s, *the overall cost of the destruction of natural resources still increased* during the study period. Thus, the authors have a very sophisticated analysis of the ecological problems in parts of China.

However, notwithstanding the growing gap between GDP and GPI for four Chinese cities, the per capita GPIs grew substantially (but at different rates) over the study period. Their GPI results over 1991–2001 for Guangzhou and Suzhou cities were comparatively higher than Ningbo and Yangzhou, as shown in *Figure 4.24* and *Table 4.24* below:

Figure 4.24. GPIs (per Capita) for China: Suzhou, Yangzhou, Ningbo and Guangzhou, 1991–2001

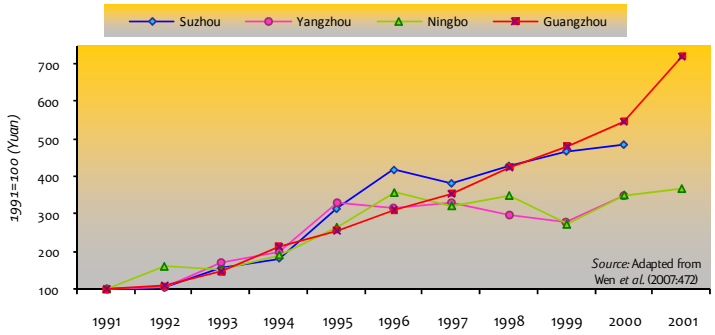
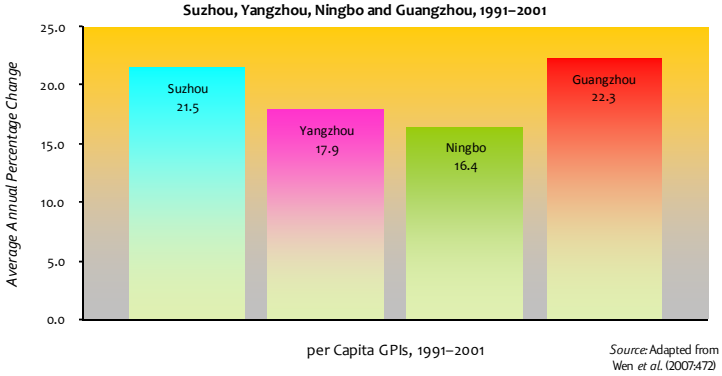


Table 4.24. GPIs (per Capita Growth Rates) for China: Suzhou, Yangzhou, Ningbo and Guangzhou, 1991–2001



The diversity of the trends in the growth rates in *Figure 4.24* and *Table 4.24* is closely connected with such factors as economic structure, energy efficiency, and environmental pollution control policy. But there are two problems concerning the results of this study. The first is that these figures are *un*adjusted for inflation. For example, a study they utilised revealed that the hours spent on household work declined in the four cities since 1991, but the values increased with time primarily because of the gradual increase of the market price of these services. Thus, all their results need to be treated with prudence because any increase in market prices over the period of study has the effect of enhancing (biasing) upwards the GPI growth trend. The second dilemma is that the authors brush aside the relatively large increases in the GPIs, i.e. they discuss the

rising trends in a single paragraph (Wen *et al.* 2007:473). This is problematic because they ignore critical role of the developmental state in promoting sustained GDP growth:

During the late 1970s and 1980s, China and other East Asian economies adopted a series of measures to socialise investment risk (originating in the agricultural sector) and to raise profits above those generated by competitive market forces. Successful export-led growth strategies involved varying combinations of supportive industry policies (O'Hara 2006c:ch.10). The long-term success rested on embedding markets in a stable, secure and more inclusive process of development, in which the emerging entrepreneurial class accepted, in return for state support, some degree of direction relating to its investment decisions. This was both to effect an adjustment to more technologically demanding activities that were more likely to guarantee rising living standards in the future, and to secure growth of jobs in labour-intensive manufacturing as a means of absorbing unskilled labour (including from the rural sectors) and reducing poverty (see Siebert 2007:893-9). The dynamic reallocation of labour from low- to high-productivity activities enabled Asian regions (especially, China) to experience robust growth of GDP, labour productivity, and employment during 1990–2007. In other words, GDP growth in China *might* be conducive to the rise in sustainable welfare, as registered by the strong increase in GPI growth of the Wen's *et al.* (2007) study.

Moreover, the authors have effectively replicated a westernized indicator into a relatively Eastern Chinese culture (albeit an increasingly westernized society). That is, they do not undertake any additional urban-area adjustments specific to the Chinese situation. Their lack of socio-historical context contrasts to the Clarke and Islam (2004) ISEW study for Thailand (by adjusting for the costs of exploitative sex work and political corruption). Nevertheless, the value of the study lies in their data calculations for the various components that comprise the GPI, which was a formidable task to collect for four Chinese cities.

4.6.8 Summary of the Subnational ISEWs and GPIs Studies

In summary, the theoretics behind the subnational GPIs are based on the methodological tools outlined in the national US GPIs by *Redefining Progress*—i.e. the commonsensical operational procedure. Only the authors of the Victorian GPI specify a real theory. All other authors profusely follow the commonsensical operational method or as some call it, "the GPI approach". Consequently, there are zero theoretical advances in almost all cases.

Yet surprisingly, the studies highlight the usefulness of the comparative analysis between the national and subnational levels. They include more inspiring discussions of the subnational performance of

sustainable well-being than the national equivalents. In particular, the authors of the Vermont, Chittenden and the Burlington GPIs (Costanza *et al.* 2004), the Sienan (Italy) ISEW (Pulselli *et al.* 2006) and the Chinese GPIs (Wen *et al.* 2007) provided a thorough comparative study, and identified several other non-conceptual problems which were innovative. We again learn that the real value of the Genuine Progress Indicator lies in its disaggregation. For instance, Lawn and Clarke (2006a, 2006b) who constructed the Victorian GPI had a thorough *disaggregated account* of the GPIs for Victoria and the Rest-of-Australia. These authors also provided a thorough environmental-historical analysis.

However, the same thorough treatment for the disaggregated account does not transfer to their aggregated level of investigation. ISEW/GPI advocates ignore capitalism, e.g. analyses of business cycles are not undertaken. The absence of critical evaluation and dissection of the subnational trends of GDP and ISEW/GPI growth is problematic. The majority of authors do not examine holistically the problem of *how GDP* (and GPI) explain real *socio*-economic processes, i.e. the Albertan GPI by Anielski (2001), Belgium ISEW by Bleys (2006a, 2006b, 2008), and the Yorkshire and Humber, and Northern Way ISEWs by Jackson *et al.* (2006). They are too absorbed in explaining *how ISEW/GPI* affects the *ecological*-economy. Yet the quality of their study depends on the number of environmental-economic parameters selected for their measure. This leads to the tendency to focus on the ecological side of the problem. The crux of the matter: a weak socio-historical apparatus is characteristic of the majority of subnational (and national) analyses. Is this a similar case for other types of net income indices? It will become evident as the literature survey continues, beginning with the Australian SNBI study in *Section 4.7* below:

4.7 Australian SNBI

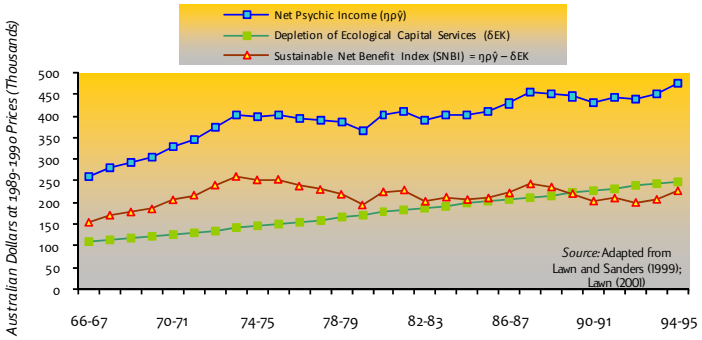
Lawn, Philip A. and Richard D. Sanders (1999) "Has Australia Surpassed its Optimal Macroeconomic Scale? Finding Out with the Aid of 'Benefit' and 'Cost' Accounts and a Sustainable Net Benefit Index", *Ecological Economics*, vol. 28, pp. 213-229.

Lawn, Philip A. (2001) *Toward Sustainable Development: An Ecological Economics Approach*, Boca Raton: Lewis Publishers.

Lawn and Sanders (1999) and Lawn (2001) develop a Sustainable Net Benefit Index (SNBI) for Australia over the 1966-1967 to 1994-1995 period. They utilise the SNBI to empirically test whether the nation has surpassed its "optimal macroeconomic scale", i.e. whether an increase in the physical scale of the macroeconomy is either beneficial or detrimental to sustainable economic welfare. In addition, they explain why GDP is unable to serve as an indicator of sustainability. They seek to answer the following problem: "To what extent should a nation continue to increase the rate of production and expand the scale of the macroeconomy?" (Lawn and Sanders 1999:215).

The SNBI is based on entropic net psychic income (see *Chapter 3*). The theory of the SNBI is important because it specifies that it is a cost to replace worn out producer goods such as plant, machinery, and equipment. The authors argue that there are two major types of final transactions in the SNBI: the "uncancelled benefits" and the "uncancelled costs". That is, apart from artefact capital itself, what remains at the end of the process is the uncancelled exchange value of the psychic income the consumer expects to gain from the artefact, and any psychic disbenefits associated with the artefact's production. In addition, there is the ecological capital services sacrificed in the process of accumulating the artefact capital—the "final or 'uncancelled' costs" of economic activity to keep the stock of human-made capital intact. Hence, the SNBI is equal to the net psychic income ($\eta\rho\hat{y}$) minus the depletion of ecological capital services (δE_K), which is shown for Australia over the 1966-1967 to 1994-1995 period in *Figure 4.25a* below:[132]

Figure 4.25a. Benefit and Cost Accounts of the Sustainable Net Beneift Index (SNBI) for Australia, 1966-1967 to 1994-1995



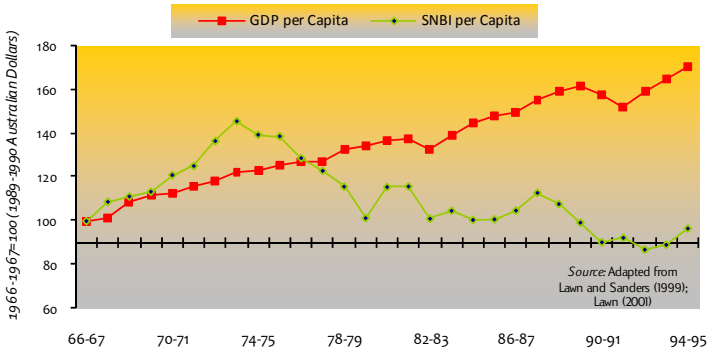
The rate of increase in net psychic income was much higher over the 1966-1967 to 1973-1974 period compared to the 1973-1974 to 1994-1995 period. Notice in the figure above that the loss of ecological capital services is continually rising over time, virtually at a constant rate. Therefore, in relation to the SNBI, it is clear that Australia is failing to invest a sufficient amount of the proceeds from non-renewable resource depletion into the cultivation of additional renewable resource substitutes. The advantage of the conceptual framework built into SNBI shines through by disentangling the index into two separate accounts.

Their results indicate that the transformation of natural to human-made capital is at the growing expense of the sacrificed source, sink, and life-support services of natural capital. The biggest increases occurred within the uncancelled cost account in the user cost of non-renewable

[132] The purpose of *Figure 4.25a* is to illustrate the advantage of separating the aggregated-index into the two major accounts. Hence, in this case it is not that important to consider changes in per capita terms.

resources, the loss of agricultural land, and in the cost of ozone depletion and long-term environmental damage. While pollution costs generally increased over the study period, such increases were moderated by improvements in waste treatment, pollution abatement technologies, and tighter legislative controls on waste emissions. According to the authors, it *appears* that Australia has exceeded its sustainability potential since 1973-1974, as the Australian SNBI per capita declined while GDP per capita continued to increase over the 1966-1967 to 1994-1995 period, as shown in *Figure 4.25b* below:

Figure 4.25b. Australian GDP and SNBI (per Capita), 1966-1967 to 1994-1995

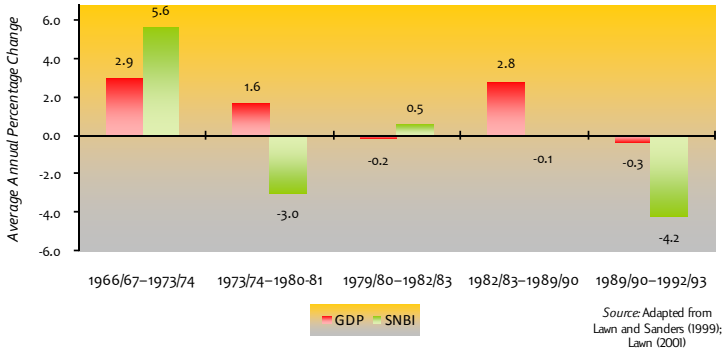


Lawn (2001:239) argues that "[b]oth the aggregate and per capita SNB index indicate the strong likelihood of the Australian macroeconomy having exceeded its optimal scale, if not, given the length of time the SNB index has been in decline, its maximum sustainable scale".[133] However, the authors heed caution regarding their SNBI results: "[o]ne can never be certain whether the total loss has exceeded a sustainability threshold[.] ... [N]ot for one moment should the index be seen as a precise measure of Australia's sustainable economic welfare" (Lawn and Sanders 1999:228).

How helpful then is Lawn's net income index for exposition of real socioeconomic processes? We dissect the trends of the Australian GDP per capita and SNBI into the recessionary (1980–1983, 1990–1993), declining (1974–1981) and booming (1967–1974, 1983–1990) cycles, as shown in *Table 4.25* on page 208. The results of sustainable economic welfare over the business cycle are mixed. For instance, as can be seen in *Table 4.25* below, the downturn of 1980–1983 was slightly "sustainable", whereas recessionary period of 1990–1993 was apparently very "unsustainable". That is, according to the SNBI, the average Australian citizen was not too fazed during the early 1980s deep recession, but was greatly dismayed during the early 1990s recession.

[133] The authors accept the principles of 'optimality': "SD [(sustainable development)] requires the transition toward an *optimal macroeconomic scale*" (Lawn 2001:309, emphasis added).

Table 4.25. Australian GDP and SNBI (per Capita Real Growth Rates), Recessionary and Boom Cycle, 1966/1967 to 1992/1993



Source: Adapted from Lawn and Sanders (1999); Lawn (2001)

A global downturn in real GDP growth occurred since the mid-1970s, where financial instabilities beset the economic subsystems. The high growth rates of GDP per capita that contributed to the speculative boom marginally weakened the SNBI over 1983–1990 period—a favourable result *apropos* the 'threshold hypothesis'—but this was not discussed by the authors. Also, the phenomenal growth in the Australian SNBI *and* high GDP growth during the mid-1960 to early 1970s is disembodied in their analysis.

In other words, the authors of the Australian SNBI are not interested in how capitalism functions over the business cycle. They are right and it is agreed that "the index [is not] a precise measure of sustainable economic welfare" (Lawn and Sanders 1999:228). But, the critical point is that we are implying that their index is futile without a strong socio-historical analysis. We cannot make a fitting judgement of the coherence of their results, because the authors have completely ignored the role of institutions affecting the business cycle.

The major components of GDP such as investment demand, consumer demand, employee compensation, and net exports are significant variables for facilitating an endogenous-institutional explanation of the peaks and troughs of the cycle (see Sherman 2003). For instance, when capitalists invest within the institutional framework of capitalist finance and capitalist production processes, the economy expands. As a result, employment expands, demand expands, and a cumulative process of economic boom is under way. Without capitalist investment, output stagnates, more workers are unemployed, demand declines, and a cumulative process of depression is under way. The two main arguments put forward in *Chapter 2* are: a) that the growth rate of GDP in a historical context is relatively good at both depicting the stage of the business cycle and any effective demand problems emanating from the system; and b) that the "shortcomings" of GDP growth make it a weak indicator of net welfare because there are many unresolved socio-ecological problems of GDP. Unfortunately, SEWI advocates have

focused simply on the welfare deficiencies problem of GDP growth (i.e. argument 'b'). However, it would have been more fruitful had the SEWI advocates centred their analysis on the net social welfare effects of the capitalist system.

Nevertheless, overall we can conclude that the SNBI is an important contribution to the literature because of the inclusion of psychic bearing and welfare maintaining (psychic outgo) variables, as well as the ecological capital accounts. For its time, it was a major advancement in the literature, because it was the first group of studies to put forward a credible conceptual framework. Their work plays a key role for the development of the much-needed progress of having separate cost and benefit accounts in national accounting systems. However, the fact that the SNBI per capita grew at an average annual rate of 0.1% over the whole study period (1967–1995) suggests that *virtually zero progress was made*, which may be true, but the authors do not make or elaborate on this point—because of their weak institutional apparatus. If not much progress was made, then perhaps from the very beginning Nordhaus and Tobin (1972:5) were right in saying, "maybe our net welfare product [under capitalism] is tautologically zero".

4.8 Australian Fisherian Income (YF)

Lawn, Philip A. (2004) "Using the Fisherian Concept of Income to Guide a Nation's Macro-Investment Policy", *International Journal of Sustainable Development*, vol. 3 (3/4), pp. 339-352.

Lawn, Philip A. (2006c) "Using the Fisherian Concept of Income to Guide a Nation's Transition to a Steady-State Economy", *Ecological Economics*, vol. 56, pp. 440-453.

Philip Lawn (2004b, 2006c) constructs a sustainable economic welfare indicator under the name of *Fisherian Income* (YF) for Australia over the 1967–1997 period. We will consider both of his works jointly because the content of the two articles is virtually identical. In these papers, the primary goal of Lawn is to demonstrate the theoretical and empirical advantages of Fisherian income over Hicksian income. Also, Lawn (2006c:442) rationalises that a growing economy along with a decline in economic welfare will tend to be the consequence of a national economy having surpassed its "optimal scale". Another aim of Lawn is to show the significance of an empirical scrutiny of the trends between physical growth and Fisherian national income.

He agrees with Fisher that a critical aspect of economic welfare is the services enjoyed by the ultimate consumers and users of the entire stock of all physical goods (i.e. "human-made capital"). Lawn (2006c:443) argues that "[i]t is the service yielded by physical goods that Fisher referred to as 'psychic income'". He provides good examples of the practical implications of Fisherian income. For instance, consider the lighting of a room by a single light bulb. The level of total (gross) welfare experienced is the same even if four light bulbs are worn out or consumed over one year in comparison to just one light bulb lasting the

full year. That is to say, the service of light is virtually continuous during the year for both scenarios. Nevertheless, when more light bulbs wear out (depreciate) over time more goods have been produced and consumed. *Net* welfare is enhanced when the actual rate of production and consumption is low.

To account for this dilemma of wrongly associating production and/or consumption with real welfare, Lawn converses on the meaning of price vis-à-vis Fisherian income. He says that it is true that the price of a durable light bulb will usually be higher than the price of a fragile light bulb. However, the price disparity rarely reflects the difference in product durability because goods prices fail to properly reflect the relative scarcity of the natural resources used in their production. In other words, according to Lawn, market prices of producer or consumption goods fail to consider that the stock of ecological capital depreciates when physical goods are produced or consumed. Lawn argues that the cost of lost natural capital services is hence deducted from the Fisherian national income, as the depreciation of ecological capital reduces the capacity of a nation to generate the net psychic income for the future. In essence, therefore, the Fisherian income is synonymous to 'entropic net psychic income', which we presented in *Chapter 3*.

Lawn thinks that the sustainable net domestic product (SNDP) or Hicksian income is a problematic approach to measuring welfare. According to Lawn, Hicksian income is the ability to keep producing the same quantity of goods over time, i.e. it is an *index of sustainable national cost* (not net welfare). But there are some similarities between Hicksian and Fisherian income. Both notions of income implicitly take into account the natural capital services lost in providing the throughput of matter-energy needed to keep the stock of human-made capital intact. And both necessitate that current consumption be included in this year's income. However, SNDP also includes this year's additions to the stock of human-made capital as current income. Conversely, Fisherian income only considers the following as part of this year's income: the services rendered in the current year from the consumption of nondurable goods and the depreciation of previously accumulated durable goods. In terms of measuring welfare, Hicksian income is less compelling than Fisherian income because, as Lawn argues, Hicksian income wrongly associates economic welfare with the rate of production and consumption. In essence, he is saying that economic welfare is linked to the *flow of net services* from production/consumption activities.

We can easily compare and contrast Hicksian income (YH) and Fisherian income (YF) with the following two identities, as shown in Eq. (4.1) and Eq. (4.2) below:

$$YH = A_K + I - \delta F_K - \delta E_K \quad (4.1)$$

$$YF = A_K + \delta F_K - \delta E_K \quad (4.2)$$

Where:

- A_K = artefact capital (private + public consumption expenditure)
- I = gross investment in durable fixed human-made capital (producer goods)
- δF_K = depreciation of durable fixed human-made capital (producer goods)
- δE_K = lost natural capital services (depreciation of the stock of ecological capital)

These two equations express each income concept in its simplest terms and are adapted from Lawn (2004b:340-1, 2006c:444).[134] Hicksian income is consumption expenditure plus the gross investment in durable fixed human-made capital subtracting the depreciation of human-made capital and the lost natural capital services. Fisherian income is equal to the private and public consumption expenditures plus the depreciation of human-made capital minus the lost natural capital services. Lawn argues that Fisherian income is superior to Hicksian income: Hicksian income wrongly counts current income as all newly produced human-made capital—i.e. that which has been produced now in order to provide welfare benefits in the future. Hicksian income erroneously subtracts the depreciation or consumption of previously accumulated human-made capital—specifically, the welfare benefits currently being enjoyed because of past production. According to Lawn (2004b:341, 2006c:445), measuring national income as per Eq. (4.1) is analogous to saying that "investing rather than consuming now involves no sacrifice in the present and that sacrifices in the past yield no current benefits". Fisherian income as defined in Eq. (4.2) surmounts this falsity.

How do the theories translate into a valuable comparative analysis? Lawn's (2004b, 2006c) empirical results of GDP, YH and YF (all in per capita terms) over the 1967–1997 period are shown in *Figure 4.26a* and *Table 4.26* on page 212. In general, YH per capita increased in almost every year during the study period, but there were falls over the downturn years of the mid-1970s and early 1980s (when per capita real GDP decreased). However, in comparison very little progress was achieved in YF per capita over the whole study period. Fisherian income predominantly declined during the 1973–1979; and grew slowly from 1980–1997. The divergence in the trends between Hicksian income and Fisherian income suggest that:

> the sustainable cost incurred during most of the study period went largely squandered since it did little to

[134] Lawn suggests that a measure of Fisherian income might also include social and environmental factors. However, he omits various social and environmental items to avoid over-complicating this calculation of Fisherian national income. The other advantage of delimiting the measure of Fisherian income to a basic version is that it can permit a more meaningful comparison with Hicksian national income. Note too that Lawn's (2004b:340-1, 2006c:446-7) empirical versions of YH and YF slightly differ to Eqs. (4.1) and (4.2).

Figure 4.26a. Australian GDP, YH and YF, 1967–1997

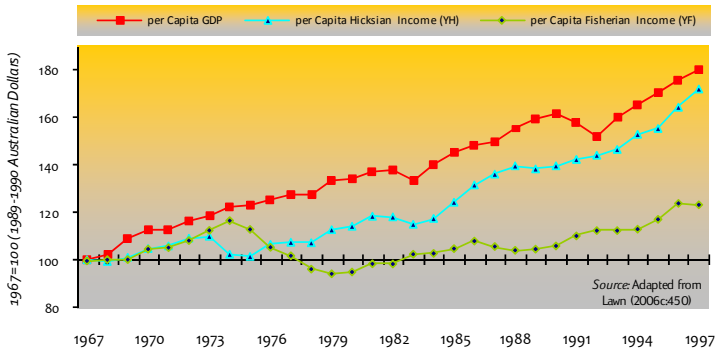
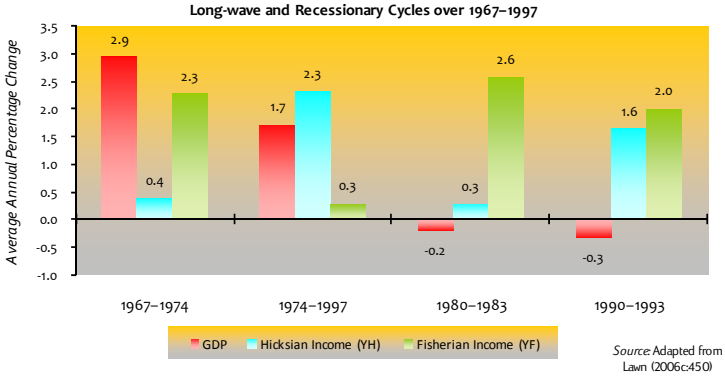


Table 4.26. Australian GDP, YH and YF (per Capita Real Growth Rates), Stages of the Long-wave and Recessionary Cycles over 1967–1997



> the sustainable economic welfare enjoyed by the average Australian citizen. ... This ... reflects the lack of effective translation of sustainable cost to sustainable economic welfare—presumably the result of excessive growth and an insufficient focus on such qualitative factors as value-adding in production, increased resource use efficiency, distributional equity, and natural capital maintenance. [Lawn 2004:349, 2006c:449,450]

These results are interesting. Lawn's (2004b, 2006c) study reveal the goodness of indicators such as Fisherian income to measure sustainable economic welfare more accurately than the alternatives of Hicksian income or GDP. This is an encouraging outcome for the advocates of net income indices.

Additionally, the author puts a great deal of attention to the 'desirability of growth' vis-à-vis the steady-state economy. As developed by Daly (1978, 1991), a steady-state economy (SSE) is a physically non-growing economy—that is, an economy where the stock of physical goods and the population of human beings are constant over time. Lawn (2004, 2006d) provides much specificity regarding the need to get to a steady state, especially for rich countries. He suggests various "growth

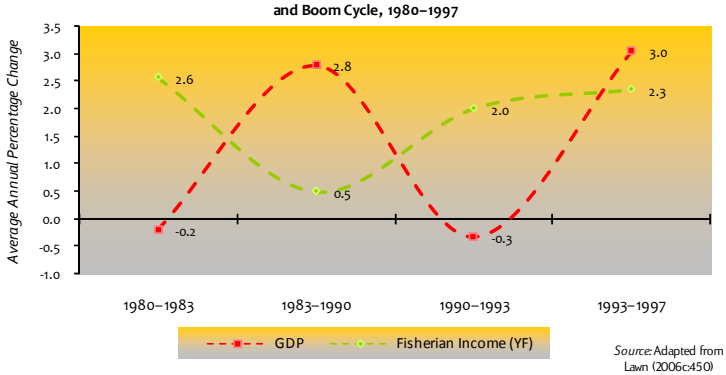
strategies" which have (or should have) been adopted. For instance, he says that a 'rapid-growth strategy' would be relatively undesirable for wealthy nations which have recently completed a long phase of industrialisation. This is because rich countries "adopting such a strategy quickly surpass its optimal scale—in which case Fisherian national income would fall—it would risk exceeding its maximum sustainable scale" (2004b:345). Only on a few occasions in the literature has an advocate been truly interested in a comparative empirical analysis between the growth rates of the economy and their net income indicator.

But there are major limitations to his descriptive approach. This is how Lawn dissects the linkage between growth and welfare: that the "high growth" and "rapid growth" policies of the late 1960s and early 1970s had a positive effect on YF per capita, but the continuation of a "high growth" policy beyond the mid-1970s led to its eventual decline. On the contrary, YF per capita recovered on both occasions that Australia made the transition to a "lower growth" rate strategy (1979–1984, 1991–1996). He argues, "Australia probably reached its optimal macroeconomic scale in the mid-1970s and *should have initiated the transition to a SSE at this time*" (Lawn 2006c:452, emphasis added). This italicised material is the crux of the problem with Lawn's empirical analyses: his 'growth strategies' are exogenous to the world-system.

Nations do not simply adopt (choose to take up or follow) 'desirable growth strategies' when they are part of a rapacious global, regional and local system. Historically, the international business cycle is linked to downturns in the US economy (IMF 2007:121-32). For example, at the macroeconomic level during the global subprime mortgage market crisis of the 2000s, the supposed risk reduction for individual capitals of securitised mortgage bonds has been transformed into an increase of the collective risk, ultimately affecting the individual units of the system. When crises emerge in one market, there is risk of contagion spreading to others and global repercussions follow. Only a perspective that examines the global system within a regional and (where relevant) national environment is appropriate to such problems. How can we achieve a SSE when continuous instability, conflict and disarray are natural to (disembedded) capitalism? Philip Lawn, the finest aficionado of the net income indicators completely ignores real socioeconomic processes of the prevailing system.

An even more pertinent question arises. What is the relationship between GDP growth and Fisherian income during the business cycle? The purpose of this inquiry is to highlight the *potential* usefulness of net welfare measures when we have a socio-historical institutional apparatus. *Figure 4.26b* below portrays the per capita real growth rates of the Australian GDP and YF over the recessionary and boom cycle of 1980–1997:

Figure 4.26b. Australian GDP and YF (per Capita Real Growth Rates) Recessionary and Boom Cycle, 1980–1997



Source: Adapted from Lawn (2006c:450)

In the figure above, there was an inverse relationship between real GDP and YF in the two recessionary phases of the Juglar cycle, 1980–1983 and 1990–1993. This *may* describe how the real workings of the socioeconomic system affect our daily lives in a positive way: that there is less ecological damage because of a reduced amount of destruction-creation, and people adapt to make the most of tougher economic times (rather than splurging on conspicuous consumption etc.) and relying on family and friends to help them through. The mean annual change of YF per capita during the 1983–1990 upswing was 0.5 percent, which is quite low, suggesting that the speculative Australian property boom in the mid-to-late 1980s was detrimental to the average citizen's 'true' economic and environmental well-being. This would make sense with social reality of this era, characteristic of reckless buying and selling of fictitious financial assets. In the recovering upswing of 1993–1997—not directly comparable with the previous upswing because of the shorter time-frame—the average annual change of YF was 2.3 percent, which is high, *perhaps* reflecting the greater degree of innovatory practices undertaken to enhance net psychic well-being. Of course, the extent to which our explanations correspond with reality is dependent on how good YF is a measure of social and environmental well-being (hypothesis three, H3).

Consequently, a relatively weak socio-historical institutional analysis is characteristic of Lawn's works on the YF (and the SNBI). A strong institutional apparatus *is* critical for a proper view of the ecological, evolutionary and socio-political dimensions of global and regional dynamics. At least Lawn's effort is much better than average, as the majority of the GPI advocates superficially breakdown the trends of GDP growth with their constructed net income indicator. He does provide a very convincing case for the empirical application of Fisherian income over Hicksian income. However, similar to the problems of his entropic net psychic income theory, his empirical analyses are diminutive of a concrete understanding of endogenous contradictory processes under

capitalism. This is our major critique of the empirical applications of the net income indicators.

4.9 A Concise Review of the Criticisms and Suggestions of Sustainable Economic Welfare Indicators

Before we provide a full summary of our conclusions, we will briefly review in *Subsections 4.9.1 to 4.9.5* the various criticisms and suggestions raised in the literature. There have been general criticisms of the ISEW, such as those raised by several authors in *The Green National Product* (1994), and specific critiques offered by Atkinson (1995) and Crafts (2002), which identify an array of measurement/valuation problems, particularly for the UK ISEW. Not strictly limited to the UK ISEW, Neumayer (1999, 2004), and Dietz and Neumayer (2007) put forward a critique of the conceptual foundation for all the net income indicators, namely the ISEW and GPI. Neri and Bradstreet (2006) agree. Also, Neumayer (2000) and Dietz and Neumayer (2006b) offer some constructive suggestions concerning measurement issues of the ISEW/GPI. Böhringer and Jochem (2007) demonstrate that the mathematical underpinnings of the net income indices are unsound. Nourry (2008) shows that relying on a solitary measure of sustainable development will give a misleading picture of reality. Ziegler (2006, 2007) scrutinises the dichotomy between the conceptual foundations and empirical applications of the ISEW; especially the notion of Daly and Cobb's (1989, 2007) person-in-community. Naturally, the advocates of net income indicators have responded to *some* of these criticisms, which responses are explained in *Section 4.10* along with a recent debate between a new critic and a leading advocate, followed by our own critical analysis of the issues in *Section 4.11*.

4.9.1 General Criticisms of the ISEW

Various Authors in *The Green National Product – A Proposed Index of Sustainable Economic Welfare* (1994), Lanham and New York: University of America.

The ramifications of including national consumption as the root

According to Robert Eisner (1994:98), the dollar dimension in the "plus-minus" structure *initiates* with personal consumption expenditures (adjusted for distributional equity). Consequently, it imposes a stringent requirement on the components because each variable should be weighted into the total in a way that is consistent with the market value to consumers. For example, the 'national advertising' item ('Column K') of the US ISEW (1) (Cobb 1989) is technically purchases by business, not purchases by consumers. Eisner (1994:103) criticises the inclusion of national advertising in the US ISEW (1) however wasteful they may be they were not in the measures of GNP or consumption to begin with. He

also argues that the ISEW's basis for estimating urbanisation costs is unwarranted and probably excessive. He suggests that urbanisation has substantial benefits that could outweigh the costs.[135] Agreeing with Eisner, Cobb and Cobb (1994) subsequently modify their original ISEW (1) to the US ISEW (2).

Mishan (1994:176) remarks that we must be aware that varying amounts of 'leisure' are necessarily involved in the consumption of the range of finished goods. Thus, leisure is important for the US ISEW; but it was excluded in the US ISEW (2). In addition, a proportion of work for which people are paid generally yields them positive satisfaction, a proportion that can be substantial for artists and professional peoples. Thus, any positive psychic income that is derived from different occupations is eliminated in the ISEW, because the measure of welfare is (partly) restricted to the value of goods consumed. However, with the development of the GPI, which includes the benefits of volunteer and parenting labour, Mishan's critique is *possibly* less commanding now than what it was.

Thomas Michael Power (1994) argues that any welfare measure (e.g. the ISEW) that begins with composite data on national income or expenditure is beset with the problem of ignoring regional differences in the value of a given level of per capita income. However, with the advent of subnational ISEWs and GPIs his critique is less valid. Yet, Allan Young and Carol Carson (1994) suggest that worldwide consumption, not merely US consumption, must be brought into the calculation. Tinbergen (1994:195) agrees with Young and Carson, and says that when scrutinising modern problems it is critical to consider the global society: "the interrelations between the world's nations have become so important that the appropriate policies must take into account the welfare of all citizens of our planet". However, global consumption-demand is not part of the SEWIs' conceptual framework.

Stocks, flows and the treatment of capitals

Robert Gottfried (1994) proposes that welfare is a function of both disposable money income (a flow of dollars per year) and of the capital stock or wealth. That is, both aggregate disposable income (flow) and wealth (stock) determine aggregate welfare. However, he suggests that either the services of capital *or* the changes in the stock of capital should be included in the ISEW. Thus, his main argument is that there is consistency in the evaluation, i.e. the variables must be either stocks *or* flows (see Gottfried 1994:139). For instance, in Cobb (1989), 'costs of water pollution', 'long-term environmental damage', and 'net capital growth' are reported as changes in the capital stock, whereas other

[135] On the contrary, Talberth's *et al.* (2007) empirical analyses show that the costs of urbanisation outweigh the benefits.

columns are pure flow variables. He goes on to argue that all capital-related columns should provide data on capital services, so that total capital services (higher or lower than the previous year) are reported. In summary, Gottfried argues that the authors of the US ISEW (1) do not treat capital consistently; sometimes they deal with capital services and sometimes with changes in capital stock.

Opposing Gottfried, Cobb and Cobb (1994:276) believe that: a) the measure of current welfare should be based on the level of services flowing from an existing stock of capital; and that b) the measure of 'sustainability' or 'the capacity to generate services in the future' should be based on changes in capital stocks. Cobb and Cobb's (1994) ISEW combines both of those features in a single index on the basis that true welfare is current enjoyment that does not take away enjoyment from future generations. Subsequently, despite the call for consistency from Gottfried (1994:139), they regard the use of two different methods for two different purposes as acceptable:

> Sustainability involves maintaining a given stock of capital to allow an equal level of income or service from it in the future. Increases in stock enhance the potential for future production of services, while decreases in the stock diminish future potentialities. The columns in the ISEW dealing with loss of mental damage [defensive private health expenditures], ozone depletion, net capital growth, and net international position all deal with sustainability and thus ought to be calculated on the basis of changes in the stock of capital. In other cases, where current enjoyment is concerned, valuation ought to be on the basis of services from that capital. [Cobb and Cobb 1994:276]

Therefore, for the "welfare–sustainability index" (i.e. ISEW), Cobb and Cobb (1994:276) believe that the measure of *current welfare* should be based on the level of services flowing from an existing stock of capital, and that the measure of *sustainability or capacity to generate services in the future* should be based on changes in capital stocks. Hence, the specifications of the aggregated welfare–sustainability index consist of current *and* future (sustainable) well-being terms. In other words, it is sometimes hard to manage aspects such as stocks of capital and flows (or funds) of service, independent and dependent variables: interdependency is more usual in empirical actuality.

Finally, the ISEW neglects technical progress and an adjustment for the improved quality of consumer goods over time (i.e. durability) and the increase in human capital (Eisner 1994:99). Eisner (1994) considers the services from human capital as the "most critical factor of

production"—albeit the ISEW, GPI, SNBI and YF exclude an adjustment of human capital. Thus, he argues, without measures of investment and depreciation of human capital it is difficult to make much of ISEW's critical measure of 'net capital growth' (Eisner 1994:100). The omissions of human capital and technical progress from a combined current-welfare *and* sustainability index have been critical issues for debate in the literature. Indeed, critics have supplied good critiques on what has been discussed in *The Green National Product*, as will become evident in *Section 4.9.2* below:

4.9.2 Core Empirical and Conceptual Critiques of the ISEW/GPI

Atkinson, Giles (1995) "Measuring Sustainable Economic Welfare: A Critique of the UK ISEW", *CSERGE Working Paper*, vol. 95-08.

Crafts, Nicholas (2002) "UK Real National Income, 1950–1998: Some Grounds for Optimism", *National Institute Economic Review*, vol. 81 (1), pp. 87-96.

Neumayer, Eric (1999) "The ISEW – Not an Index of Sustainable Economic Welfare", *Social Indicators Research*, vol. 48, pp. 77-101.

Neumayer, Eric (2000) "On the Methodology of ISEW, GPI and Related Measures: Some Constructive Suggestions and Some Doubt on the 'Threshold' Hypothesis", *Ecological Economics*, vol. 34, pp. 347-361.

Neumayer, Eric (2004) "Sustainability and Well-being Indicators", *UNU-WIDER Research Paper*, vol. 2004/23.

Dietz, Simon and Eric Neumayer (2006b) "Some Constructive Criticisms of the Index of Sustainable Economic Welfare", in Philip A. Lawn (Ed.), *Sustainable Development Indicators in Ecological Economics*, Cheltenham, UK: Edward Elgar, pp. 186-208.

Neri, Frank and Paul Bradstreet (2006) "Comment on "Measuring Victoria's Genuine Progress: A Genuine Progress Indicator (GPI) for Victoria"", *Economic Papers*, vol. 25 (3), pp. 295-297.

Dietz, Simon and Eric Neumayer (2007) "Weak and Strong Sustainability in the SEEA: Concepts and Measurement", *Ecological Economics*, vol. 61, pp. 617-626.

The ISEW is a sensitive operational procedure

Giles Atkinson (1995) and Nicholas Crafts (2002) expose serious flaws in the methodologies or technical methods employed for the UK ISEWs.[136] Atkinson (1995) sets out an alternative and more rigorous treatment of the valuation methods of Jackson and Marks (1994). He considers the rationale for the adjustments to be sound, but the problem is a small number of factors dominate the index. For example, much of the down turn in the 1980–1990 period in the UK ISEW (1) was attributable to changes in the value of non-renewable resource depletion, long-term environmental damage and ozone depletion. Atkinson (1995) is critical that the price chosen to reflect long-term environmental damage per unit of pollutant emitted is unquestionably too high and largely arbitrary. Thus, he shows that we can attach little credibility to the magnitudes that the authors propose and their rates of change over time: in Jackson and Mark's (1994) study, the claim that the growth achieved in welfare over the 1950–1970 period has been largely eroded by 1990 "is fundamentally flawed" (Atkinson 1995:29).

Crafts (2002) also points out that the ISEW is a very sensitive operational procedure. The authors of the UK ISEW (2) claim that there

[136] Specifically, Atkinson (1995) critiques the UK ISEW (1) study (Jackson and Marks 1994) and Crafts' (2002) critique relates to the UK ISEW (2) (Jackson *et al.* 1997).

has been an absolute decline in sustainable living standards in the UK since the mid-1970s. But, Crafts revises the national UK ISEW (2) by Jackson *et al.* (1997) to make it more nearly a measure of utility-based Hicksian income. He considers the rationale for some of the benefit/cost adjustments to be unsound. In particular, a critical omission from the ISEW is the improvement over time in life expectancy—one of the most dramatic feats of the twentieth century was the rise in life expectancy at birth to almost 80 years from a level about half that in 1870. He notes that the ISEW fails to take account of the high value that people place on the reductions in mortality risks that have been very important achievements of government health expenditure as well as private initiative. He argues that ISEW should be revised to take account of much-improved life expectancy. His investigation shows that implementing the suggested revision reverses the finding of the absolute decline in sustainable economic welfare since the mid-1970s. It is "simply not plausible" (Crafts 2002:88). Thus, Atkinson (1995) and Crafts (2002) reveal (upon closer inspection of the net welfare measures) that the original declinist claims are lacking in methodological robustness.

Lack of a theoretical foundation, and arbitrary assumptions about human capital formation and technological progress

One of the most influential critics of the net welfare indicator is Eric Neumayer. He argues that the corrections in the ISEW are simply undertaken without giving any theoretically sound justification for doing so.[137] For example, Neumayer (1999:83) criticises the dubious concept of 'defensive expenditures': "one could argue that at least part of food, drink, entertainment and holiday expenditures are caused by the stressful, exhausting and boring modes of modern production that make these expenditures necessary as a defence against their unwanted side effects".[138] He also recognises an inherent weakness of the *single* composite indicator (akin to the ISEW, GPI, SNBI, YF.). That it includes a correction term for income inequality, but does not include a correction term for the degree for political freedom, a correction term for the degree of equality based on gender, etc. "And how do you provide a reliable estimate of these correction terms?" (Neumayer 1999:83). This is his most powerful argument for a lack of theoretical foundation.

Moreover, Neumayer shows that with the inclusion of the positive

[137] At the time, the theoretical critiques raised by Neumayer (1999:82) relate to the US, German, UK (1, 2), Swedish, Austrian, Italian ISEWs.

[138] This was a rather weak assessment by Neumayer, as he does not refer to any of Leipert's writings on compensative/defensive expenditures (e.g. see Leipert 1986, 1989a, 1989b). Yet, Dietz and Neumayer (2006b:202, 2007:622) still hold onto the view that "[t]here are both conceptual ... and practical problems ... with deducting defensive expenditures that ultimately make the endeavour, in the view of some, a "dead end" (Brouwer and Leipert, 1999, p. 196). ... [T]he major problem with deducting defensive expenditures is where to draw the line".

effects flowing from human capital formation and technical progress, and different assumptions about the weighting of the income distribution, one reaches a completely different picture of a society's "sustainable welfare". By excluding investment into human capital and technical progress from their measurement, Neumayer (1999:87-8) says that the "ISEWs are constructed in a way that prompts one to suspect that their very aim is to show that welfare is lower than GNP and has risen much more slowly than indicated by GNP or has even fallen". With the inclusion of education expenditures he shows that the level of welfare is considerably higher than the Cobb and Cobb (1994) ISEW.

In addition, the corrections for the depletion of non-renewable resources and long-term environmental damage manipulate the index. For example, without the corrections for the depletion of non-renewable resources, long-term environmental damage and ozone depletion, the US ISEW (Cobb and Cobb 1994) in 1990 would be 83.5 percent higher. Neumayer argues that these relatively large subtraction terms dominate all the other subtraction terms by one or two orders of magnitude.[139] The potential costs of long-term future welfare damage from global climate change are uncertain, yet a simple monetary estimate is used. Therefore, the ISEW conclusions are highly dependent on certain key and rather arbitrary assumptions about the weighting of income distribution, the valuing of depletion of non-renewable resources and long-term environmental damage. Only a few of the advocates have directly confronted these critiques.

The ISEW meshes two separate identities: current welfare and sustainability

Neumayer (1999, 2004) argues that GNP was never intended to be a measure of welfare and the need for an alternative *single* indicator of welfare *and* sustainability (i.e. the capacity to provide future welfare) is superfluous. In the words of Neumayer (2004:1,4), "[c]ontrary to well-being itself, which has an orientation towards the present, sustainability is a future-oriented concept. ... [C]urrent well-being is affected by the way in which current total capital is used. Sustainability is only affected if the total capital stock itself is affected". For instance, he remarks that the valuation of leisure time has no direct link whatever to sustainability, and that the distribution of income at any given point in time does not directly impinge upon the capacity to provide future welfare (see Neumayer 1999:84-5,92). Thus, according to Neumayer there is a need to measure separately 'welfare' and 'sustainability' because doing otherwise

[139] Also for the long-term environmental damage component, Cobb and Cobb (1994:266) have supposedly ignored technical progress in their computation of non-renewable resource depletion because technical progress brings about cheaper renewable resources alternatives in the foreseeable future (see Neumayer 1999:85).

leads to methodological inconsistencies, and these entities are too complex to be dealt with by a single indicator, such as the ISEW/GPI/SNBI/YF. My experiential critique of the SEWIs in *Section 4.11* is in agreement with part of his view: measuring both *sustainable* and *economic welfare* in a single monetary-based index leads to problematic results.

The ISEW implicitly assumes perfect substitutability within and between ecological capital and other forms of capital

A significant critique by Neumayer (1999, 2000, 2003:ch.5) is that the ISEW implicitly assumes perfect substitutability within and between ecological capital and other forms of capital. Neri and Bradstreet (2006) share a similar view, but they specifically direct the criticisms to Clarke and Lawn (2005) and their Victorian GPI study.[140] That is, the critics agree it is based on 'weak sustainability' (see Neumayer 1999:92-3). The aggregated ISEW does not explicitly distinguish sub-indices for different forms of total capital (e.g. human-made and natural capital) and different the forms of natural capital (e.g. renewable and non-renewable resources), but simply computes an overall index. "This meshing together of values from natural and other forms of capital amounts to a conceptual break since the heart of the concept of strong sustainability demands that natural capital itself and even sub-categories of natural capital are held constant" (Neumayer 1999:93).[141] Dietz and Neumayer (2007) and Brennan (2008) realise that the ISEW/GPI were intended to support the propositions of strong sustainability. "However, by assuming that the diverse components of comprehensive utility can be simply added together in arriving at an overall indicator, they are a measure of [weak sustainability], not [strong sustainability]" (Dietz and Neumayer 2007:621). Therefore, the subjacent presupposition is that an increase in one component can compensate for a decrease in another, e.g. an increase in resource depletion can be offset by an increase in personal consumption expenditures.

Lack of a support for the threshold hypothesis

Many empirical works supposedly reveal solid support for the threshold hypothesis, for example, Clarke and Islam (2005a) and Jackson *et al.* (1997) based on their empirical analyses of ISEW and GDP. However, one must be cautious to interpret their trend results of a potential threshold limit as having much significance. Neumayer's (2000) and Dietz and Neumayer's (2006b) papers have tried to show that the threshold, if existent, is not due to factors related to the destruction of

[140] Yet their criticisms are nothing more than a rehashing of Neumayer's critiques.
[141] True, but the SNBI does distinguish between human-made and natural capital, and the different forms of natural capital.

the natural environment. They argue that the widening gap between GNP and the ISEW/GPI might be the artefact of highly contestable methodological assumptions. They show via sensitivity analysis that if the cost escalation factor in the valuation of non-renewable resource depletion and the assumption of cumulative long-term environmental damage is abandoned, then these items no longer give evidence to a threshold hypothesis. Thus, the critics raise an important and valid argument: that the empirical results are dependent on many arbitrary assumptions, which influence the declining or stabilising trend.

4.9.3 A Mathematical Index-Formation Critique of the ISEW/GPI

Ebert, Udo and Heinz Welsch (2004) "Meaningful Environmental Indices: A Social Choice Approach", *Journal of Environmental Economics and Management*, vol. 47, pp. 270-283.

Böhringer, Christoph and Patrick E. P. Jochem (2007) "Measuring the Immeasurable – A Survey of Sustainability Indices", *Ecological Economics*, vol. 65, pp. 1-8.

The authors argue that ISEW/GPI fail to meet fundamental scientific requirements and rules for aggregation. That is, according to Böhringer and Jochem (2007:2), scientifically sound methods for normalisation (to make data 'comparable'), weighting (to specify the 'correct' interrelationships), and aggregation (to get the 'right' functional relationship) are pre-requisites for the construction of meaningful sustainable development indices. In ISEW/GPI, all the adjustments are monetarised such that aggregation is achieved by simply adding up. In line with Ebert and Welsch (2004:281), this procedure of normalising data before aggregating them does not provide a solution to the 'noncomparability' of the data. Rather, the arbitrariness of the normalisation rules introduces additional ambiguities. Hence, the crude variables that comprise the ISEW/GPI are *noncomparable* since their scaling can be changed independently. For example, the time (number of hours) spent volunteering or undertaking housework is incomparable with an index of air pollution (e.g. sulphur dioxide, nitrogen oxide, and particulate matter). Yet according to Böhringer and Jochem (2007), noncomparability is not the chief setback.

Aggregation of variables measured in ratio-scale when the variables are not directly comparable would call for a geometric mean, however, these indices are based on a (misleading) arithmetic mean (Böhringer and Jochem 2007:3). In other words, ISEW and GPI are inherently inconsistent because they violate these qualifying conditions. On a positive note, the authors say that it would be straightforward to aggregate indicators by a geometric mean of the crude (i.e. unnormalised) data (instead of the used arithmetic mean) to assure consistency and meaningfulness (see Böhringer and Jochem 2007:6). If they are correct then the implication of this finding is significant: all empirical data on SEWIs (including the studies presented in this chapter) would need to be entirely rewritten to conform to these aggregation

rules. Up to the time of writing (April 2009), SEWI advocates have not addressed this potentially serious problem.

4.9.4 French ISEW and GPI, 1990–2002

Nourry, Myriam (2008) "Measuring Sustainable Development: Some Empirical Evidence for France from Eight Alternative Indicators", *Ecological Economics*, vol. 67, pp. 441-456.

This paper by Nourry (2008) presents results from time-series analysis of eight measures for France such as the green national net product, the Genuine Savings, the ecological footprint, ISEW, GPI and two "green" Human Development Indicators. The purpose of her paper is to draw a parallel between the eight measures to determine whether the indexes show a trend towards sustainable development. The relevance is that ISEW and GPI per capita (in real terms) are constructed for the period 1990–2002. But note, a critical evaluation of this paper is not featured in the main body of the literature survey: this is because the French ISEW/GPI take up a small fraction of her analysis. The other problem is that the author has not provided the raw data on these measures. Suffice to say, the author makes no theoretical advances and offers no socio-historical institutional analysis of the trends between GDP and the ISEW/GPI. Nonetheless, the main contribution of Nourry's (2008) paper is to show that study of a single measure is insufficient to assess sustainable development. The SEWI advocates would agree. However, Nourry (2008) does not address the predicament of whether these composite measures, ISEW, GPI and its variants are in fact worthy of being supplemented or discarded completely. This is a critical question in light of a growing disenchantment in the literature over the applicability of reductionist metrics and tools for sustainability assessment (e.g. Gasparatos *et al.* 2008).

4.9.5 The Debunking of Persons-in-Community in the ISEW

Ziegler, Rafael (2006) *Political Perception and the Ensemble of Value and Measure*, McGill University, Montreal, Quebec, Canada: Governance for Sustainable Development, GoSD Working Paper No. 4, March 2005 (Updated January 2006).

Ziegler, Rafael (2007) "Political Perception and the Ensemble of Value: The Paradox of the ISEW", *Environmental Values*, vol. 16, pp. 43-60.

Daly, Herman E. and John B. Cobb Jr. (2007) "ISEW. The 'Debunking' Interpretation and the Person-in-Community Paradox: Comment on Rafael Ziegler", *Environmental Values*, vol. 16 (3), pp. 287-288.

Ziegler (2006, 2007) tries to reconstruct the ontological option that Daly and Cobb develop in *For the Common Good*. Why? Daly and Cobb (1989) attempted to show via ISEW the limitations and consequent errors of the belief that the measure of economic activity (GDP growth) can serve as an indicator of economic welfare. They wanted to depart from *Homo Economicus* to 'person-in-community'.[142] The person-in-community

[142] Rather than thinking of society as an aggregate of individuals with given preferences, they propose to replace this description "with an image of *Homo Economicus* as person-in-community" (Daly and Cobb 1994:159).

approach acknowledges the importance of community *and* the diversity of the individual—thereby without claiming that the person is entirely determined in its choices by the community. It aims to illuminate the critical issues that need to be considered when measuring questions of agency and social well-being. Daly and Cobb's model was meant to examine the whole of relationships that are central for self-understanding, preference formation and well-being. But,

> [f]aced with the measure and objective of economic growth, they develop an alternative index. The need to produce an alternative measure seems so strong that it *leads to the almost complete bracketing of their prior work on person-in-community*, the emphasis put there on communal structure and the consequent question mark behind any attempt to capture economic welfare with one, monetary numeraire based on personal consumption. [Ziegler 2007:53, emphasis added]

That is, Zeigler (2006, 2007) discovers that the conceptualisation of economic welfare in terms of personal consumption in the ISEW is paradoxical.

On balance, the structure–objective of consumption transcends the relationships said to be constitutive of persons-in-community. "Consumption brackets relationships at work, recognition and stigmatisation, and more generally the social fabric of the production and consumption process" (Zeigler 2007:51).[143] He argues that the consumption base does not even add these features of economic welfare, "contrary to the fact that consumption can go up, but work relations deteriorate (or conversely recognition via workplace democracy may increase, but income decrease)" (Zeigler 2007:51).[144] The significant argument for the inclusion of income distribution is also not based on community. The argument rests on the principle of marginal utility (see Daly and Cobb 1989:402)—there is no justification in terms of equality considerations as a demand of democratic communities. And he criticises Lawn's theory, arguing that the psychic flux of individuals likewise stands in tension with the description of person-in-community. In other words, the main argument of Ziegler (2007) is that the ISEW is not systematically built from the theory developed by Daly and Cobb (1989).

---

[143] Of course, Mishan (1994) already noted the problematic of having an index of net *consumption*. On the other hand, Ziegler does not realise that Lawn sees consumption as a "necessary evil". Ziegler also underplays the significant role of service and oikonomia which underlie the conceptual framework of the ISEW (see *Chapter 3*).

[144] Stockhammer *et al.* (1997:33) were the first in the literature to realise that the ISEW does not incorporate an adjustment of the antagonistic working class relations of capitalism.

Daly and Cobb (2007) verify this 'debunking interpretation' of the ISEW. They agree wholeheartedly with Ziegler that more attention has been paid to the ISEW that has probably deflected attention from the more basic person-in-community argument. They also advocated strong sustainability, but recognise that the construction of the ISEW in the appendix assumes weak sustainability: "an index that converts both manmade and natural capital into 'dollar's worth' units makes them fungible in terms of that imposed common unit of measure. From a dollar's worth standpoint they are then substitutes, not complements. Without complementarity there can be no strong sustainability" (Daly and Cobb 2007:288). Nevertheless, they argue that at a minimum the ISEW should question the viability of GDP.

We have arrived at parallel conclusions after undertaking a comprehensive literature review of all the relevant empirical studies: that Daly and Cobb's (1989) notion of an "economics for community" apparently disappears in the construction of the net income indicators. We also agree wholly with Zeigler (2007:52) that "[t]he preparatory work on person-in-community really does achieve one thing: it shows just how questionable the idea of one monetary value as an indicator for sustainable welfare really is". The problematic of the all-inclusive indices is strengthened through our applied empirical investigations in *Section 4.11*. Firstly, it is important to discuss the advocates' responses (if any) to the rather large list of problems/criticisms, beginning with the support for a theoretical foundation of the net income indices in *Section 4.10* below:

4.10 Arguments by SEWI Advocates—But Are they Powerful Enough to Address the Lingering Problems?

4.10.1 The Theory and Method-Techniques of Net Income Indices

Lawn, Philip A. (2003) "A Theoretical Foundation to Support the Index of Sustainable Economic Welfare (ISEW), Genuine Progress Indicator (GPI), and Other Related indexes", *Ecological Economics*, vol. 44, pp. 105-118.

Lawn, Philip A. (2005) "An Assessment of the Valuation Methods Used to Calculate the Index of Sustainable Economic Welfare (ISEW), Genuine Progress Indicator (GPI), and Sustainable Net Benefit Index (SNBI)", *Environment, Development and Sustainability*, vol. 7, pp. 185-208.

Lawn, Philip A. (2006a) "An Assessment of Alternative Measures of Sustainable Economic Welfare", in Philip A. Lawn (Ed.), *Sustainable Development Indicators in Ecological Economics*, Cheltenham, UK: Edward Elgar, pp. 139-165.

Lawn, Philip A. (2006b) "Sustainable Development: Concept and Indicators", in Philip A. Lawn (Ed.), *Sustainable Development Indicators in Ecological Economics*, Cheltenham, UK: Edward Elgar, pp. 13-54.

Clarke, Matthew and Philip A. Lawn (2006) "A Response to "Comment on Measuring Victoria's Genuine Progress: A Genuine Progress Indicator (GPI) for Victoria"", *Economic Papers*, vol. 25 (3), pp. 298-300.

Lawn, Philip A. (2007) "A Stock-Take of Green National Accounting Initiatives", *Social Indicators Research*, vol. 80, pp. 427-460.

Forgie, Vicky (2007) "The Need for 'Convention' in Environmental Valuation", *International Journal of Environment, Workplace and Employment*, vol. 3 (2), pp. 72-90.

Clarke, Matthew (2007) "Is the Genuine Progress Indicator Really Genuine? Considering Well-Being Impacts of Exports and Imports", *International Journal of Environment, Workplace and Employment*, vol. 3 (2), pp. 91-102.

Niccolucci, Valentina, Federico Maria Pulselli and Enzo Tiezzi (2007) "Strengthening the Threshold Hypothesis: Economic and Biophysical Limits to Growth", *Ecological Economics*, vol. 60, pp. 667-672.[145]

Solid theoretical foundation (apparently): 'optimal macroeconomic scale'

According to the authors of the SNBI, the theory for the ISEW/GPI is based on a *macroeconomic* perspective of classical microeconomic theory of constrained optimisation. The SNBI fundamentally corresponds to the methods of the ISEW and GPI, as the authors conceptually link the SNBI/ISEW/GPI to a marginal benefit/marginal cost framework (see Lawn and Sanders 1999:216-7). Their primary objectives are to calculate a pecuniary measure of net psychic income and have a monetary quantification of the lost services from ecological capital over time (Lawn and Sanders 1999:220).[146] The authors argue that to account for the costs of growth, ascertaining whether any given macroeconomy is nearing or has surpassed its optimum is required. That is, the economy must have a proper scale relative to the ecosystem.[147]

Lawn attempts to develop a realistic model describing the relationship between the "uncancelled benefit" and "uncancelled cost" accounts (see Lawn 2001:ch.6, 2006b:39). The uncancelled benefit account (the net psychic income) is subject to the law of diminishing marginal benefits (utility). The uncancelled cost account (loss of natural capital services) is attributable to the law of increasing marginal costs.[148] He shows that (broadly speaking) continued physical expansion of the economic subsystem beyond the optimal scale is antithetic to the sustainable development goal because it eventually leads to a decline in sustainable economic welfare. In other words, the authors put forward *what they argue* is a solid theoretical framework for the SNBI/ISEW/GPI (e.g. Clarke and Lawn 2006:300). They also show that there is much value in critically evaluating "the gap" between the physical economic growth and the net income indicator.

---

[145] The paper by Niccolucci *et al.* (2007) is not evaluated in *Section 4.3* because there are no new calculations/constructions of net income indicators. Note too that the papers by Lawn and Sanders (1999) and Lawn (2001) are relevant to *Section 4.7*.

[146] Psychic income and the psychic outgo of the economic activity, i.e. the net psychic income is net effect of the modes of experience and is measured in 'pecuniary terms' (see Lawn 2001:225-9).

[147] Lawn (2001:77) diagrammatically adopts the notion of 'optimal macroeconomic scale' from Daly (1991:28).

[148] The law of diminishing marginal benefits: enjoyment of the service increases at a diminishing rate as consumption of physical goods increases. People may lose interest even though the item of wealth is not physically depreciating, e.g. the enjoyment of playing a music compact disc repeatedly may only last for a short time. The law of increasing marginal costs: for each further unit of economic expansion a more important ecosystem service is traded-off, as the macroeconomy expands relative to a finite natural environment. Costs increase because the more readily available higher-quality resources are extracted first, followed by the more complicated and expensive task of extracting lower quality resources.

Criticisms of the SNBI, ISEW, and GPI evaluated by Lawn

Lawn (2003:108) notes that "surprisingly little effort has been devoted towards the establishment of a theoretical foundation to support [the ISEW and GPI]". In response to Neumayer (1999, 2000)—who argued that the ISEW/GPI is based on a makeshift accounting framework with no theoretical foundation—Lawn (2003) seeks to demonstrate that the net income indicators are based on a sound theoretical 'income' foundation, and stresses that they would be increasingly accepted if a more robust and consistent set of valuation methods were employed in their calculation. As we have systematically argued in *Chapter 3*, the SEWI could be based on entropic net psychic income. Lawn details each item within the ISEW, GPI, SNBI, e.g. consumer durables, publicly provided human-made capital, defensive and rehabilitative expenditures, linking them all to the Fisherian concept of income and capital (see Lawn 2003:112-5, 2005:185-208, 2006a:146). For example, Lawn argues that "if the undesirable side-effects of economic activity are not deducted, personal consumption expenditure will overstate the psychic benefits generated by the economic process" (Lawn 2005:200).[149] Hence, to account for the *net* psychic income, subtracting defensive expenditures from consumption is required; as shown by Lawn, this adjustment is consistent with Fisher. The theory of entropic net psychic income is perhaps the most convincing response by the advocates of net income indicators.

Lawn (2003) also welcomes Neumayer's critical analysis, and evaluates the criticism of whether the (typically declining) trends of the ISEW, GPI and SNBI are the product of the subconscious desire to connive an index to vindicate a threshold hypothesis. Lawn (2005:202-5, 2006a:157-60) provides a strong counter-argument regarding non-renewable resources having to be fully replaced in the present when there are reserves available for many years to come. This is because, he argues, the ISEW and related measures are interested in the *sustainability* of, as well as the *current* welfare generated by economic activity. However, Neumayer (2004, 2007) is not entirely convinced of Lawn's argument, and hence the subject area of an all-in-one indicator of "sustainable economic welfare" remains contentious.

As well, Lawn deals with Neumayer's (2000) claim that the use of the Gini coefficient to establish an index of distributional inequality is very subjective and *ad hoc*. Lawn (2005) disagrees with him, because by starting with an index value of 100.0, the Gini coefficient method makes no subjective assumption about the desirability of the distribution of income at the beginning of the study period: "It is only assumed that an

[149] Indeed, the SNBI/ISEW/GPI already includes items to capture some of the costs of undesirable forms of consumption such as the impact of additional health costs and reduced productivity (Lawn 2005:193).

improvement/deterioration in the distribution of income has a positive/negative impact on the overall welfare of a nation's citizens" (see Lawn 2005:196). However, Lawn (2005:196-7) suggests there needs to be more deliberations on the issue of weighting the "final ISEW" value, rather than the "raw ISEW" value (i.e. private consumption expenditures) as Stockhammer *et al.* (1997) did. For instance, Lawn says that it could be successfully argued that the cost of environmental damage, crime, and family breakdown is disproportionately borne by the poor—and therefore it would be preferable to adjust the whole index. Ultimately, the SNBI cannot provide a transparent indication of the distribution and ownership of net benefits enjoyed by various heterogeneous agents, as it is argued in *Chapter 6*.

Limitations of the SNBI, ISEW, and GPI evaluated by Lawn

A major controversy surrounding the net income indices is the reliance on "private consumption expenditure" as the reference point for measuring economic welfare. But, according to Lawn (2001:222-3), the majority of consumer goods are purchased, "*not with the idea of consumption in mind, but largely for the services they yield*. ... People will generally pay a higher price for a commodity embodying superior service-yielding qualities. Consequently, a measure of psychic income can be approximated with the use of market prices". Lawn follows Daly (1991): that the service yielded by commodities completely consumed during the accounting period in which they are purchased can be valued at their actual market prices. He argues that market prices and the rental values of physical commodities are readily available (see Lawn 2005:194), and that there is an advantage in having price-based measures of sustainable economic welfare.

However, market prices and rental values vary for reasons other than from changes in their service-yielding qualities. "Clearly, for prices to remain a proxy indicator of psychic income, it is necessary to eliminate all price-influencing factors other than those related to a commodity's service-yielding qualities" (see Lawn 2001:223, 2005:194). Evidently, it is very difficult from a practical perspective to eradicate all price-influencing dynamics.[150] He concludes that by utilising the 'real value' (i.e. prices adjusted for inflation) of private consumption expenditures as the reference point is the most desirable option. This is because "it is reasonable to assume that, through technological progress, the service-yielding qualities of most commodities will continue to increase for some time to come (i.e. increase the service efficiency of human-made capital)"

[150] According to Lawn, the price of a commodity is effected by: a) the relative prices of the different forms of low entropy available to produce it; b) the actual quantity or supply of the commodity itself; c) changes in taxes; d) the nominal money supply; and e) the opportunity cost of holding money.

(Lawn 2001:223-4, 2005:194-5) (and Lawn and Clarke 2008b:73). The implicit assumption is that any positive impact on psychic income over time is probably well reflected by an increase in real private consumption expenditure.

On the other hand, Lawn realises that there is need to supplement the SNBI/ISEW/GPI because many welfare-related factors have been overlooked (citing the disutility of work and the existence values of natural capital) and ascertaining monetary estimates for some of items involves a great deal of 'subjectivity' (see Lawn 2001:258-60, 2003:115). He suggests that the indicators of sustainable economic welfare must be supplemented by a satellite account of natural capital to determine whether the changing level of economic welfare is ecologically sustainable. In addition, the SNBI does not convey the future impact of current activities; this reduces the indicator policy effectiveness—a consequence of the definition of sustainable economic welfare being measured (Lawn 2003:116). On the other hand, according to Lawn, the net income indicators do express a wealth of information on the current manifestations and immediate effects of past and present human activities. Lawn therefore believes that despite the above limitations the SNBI/ISEW/GPI/YF are very good measures of the benefits and costs of economic, social and environmental activity over time. (We critically evaluate the extent to which the net income indicators are good measures of sustainable economic welfare in *Section 4.11* below.)

The need for convention in SEWIs

National Income and Product Accounts (NIPAs) are mainly derivatives of rule-based accounting systems. The use of particular methods in SNA to make the system work is often *due to convention*, albeit the approach taken may not be strictly accurate. In other words, the methodology to calculate GDP, as set out in the SNA, requires general agreement about various assumptions. Therefore, the main argument by Vicky Forgie (2007:79) is that establishing similar 'conventions' would increase the acceptability of the GPI to both government agencies and the public. The most important point is that "some theoretical framework is required to determine what to include/exclude" because there are infinite potential inclusions both for social and environmental factors (Forgie 2007:79). Besides Philip Lawn, very few SEWI advocates attempt to formulate and discuss these issues. Unlike Forgie (2007), our main argument is that as a minimum the theoretical foundation must be set in context with a specific socioeconomic system.

The open (ecological-) economy GPI

Matthew Clarke (2007) looks at the theoretical necessity and the practical feasibility of creating an open economy GPI that considers the welfare

impacts of exports and imports. Clarke's major point is that the GPI should concern the 'ownership' of the costs and benefits connected with economic growth rather than with the 'location' of those costs and benefits. The structure of GPI allows a nation to enjoy, *gratis*, the benefits of importing goods from countries that carry a disproportionately large cost of environmental degradation. This results in an exaggeration of the real progress experienced by the country importing 'dirty goods' (linked to environmental waste in the country of origin). Clarke goes into some detail about this problem but only relates it to environmental degradation *not social or cultural decay*. However, these are critical issues as we argue in *Chapter 6*. He mentions a global GPI, but thinks the criticality of the SEWI research project lies in working out an open economy GPI for particular nations (see Clarke 2007:96). The advance Clarke makes is very good, but this conjecture is that GPI is still a good measure of net welfare. This simply requires gradual evolutionary enhancement of the basic structural foundation, rather than calling for a radical overhaul (*contra* Clarke) of the GPI accounting scheme.

Some support for the threshold hypothesis: SEWI and biophysical indicators

Finally, Lawn (2007) stipulates that if there is a reduction in some of the arbitrariness involved in the calculation of the influential components contributing to the decline or flattening trend in the ISEW, then the ISEW *et al.* may gain wider respect and acceptance in the economic community. He notes that economic indicators reveal only so much about the sustainable development performance of a nation/area. That is, the ISEW/GPI/SNBI/YF should be supplemented with non-economic indicators. He suggests that non-economic indicators, particularly *physical indicators based on biophysical assessments*, are of greatest value to policy makers in ascertaining the ecological impact of human activities. A well-known biophysical indicator is the ecological footprint.

The 'ecological footprint' (EF) is a measure of how much productive land and water an area requires to produce all the resources it consumes (food, energy and materials), and to absorb all the waste it generates using established technology. The EF therefore increases with increasing consumption. The counterpart of a nation's EF is its biological capacity: the maximum supply of natural resources and ecological services that can be provided by an area. The biocapacity represents the theoretical maximum resource capacity in a year. It can be used as a comparative term to reveal whether existing natural capital is sufficient to support human consumption patterns.[151] A country with an EF higher than its

[151] The units are global hectares (gha) or hectares with the potential to produce usable biomass equal to the world's potential average for that year. The EF reflects the efficiency with which natural resources are turned into consumption. The EF changes with population size, average

biocapacity is in a state of 'ecological deficit' and cannot meet the human demand for resources in a sustainable way. In contrast, if the EF is less than biocapacity, the country is in a state of 'ecological surplus'. In a similar fashion to how a widening gap between GDP and SEWI can explain a reduction in welfare over time, an ecological deficit (overshoot) implies the reaching of biophysical limits to growth.

Niccolucci *et al.* (2007) briefly look at the trends of the EF vs. biocapacity and the ISEW/GPI vs. GDP within six nations (three cases): Italy and Germany; Sweden and Australia; and the US and Austria. Firstly, the Italian and German cases are unconvincing. The increase in environmental pressure matches a growing gap between GDP and ISEW in the late 1960s (Italy) and early 1980s (Germany), but it is not comparative to the EF/biocapacity accounts. Yet, the authors suggest that a low but increasing GDP–ISEW gap is being maintained by accumulating environmental debt towards other countries or generations. For the Swedish and Australian cases, "both have an ecological surplus ... due mainly to a vast environmental heritage and low population densities[.] ... [The] ISEW stagnated after 1980 in both cases, probably due to decreasing ecological surpluses" (Niccolucci *et al.* 2007:670). Regrettably, the authors' commentaries are incredibly thin; only general observations are given with no detailed breakdown of the various trends of GDP, ISEW, EF and biocapacity.

Nevertheless, the third case of the US and Austria provides *some* support for the threshold hypothesis. They observe that the ecological overshoot occurred in 1965–1970 (US) and 1980–1985 (Austria) corresponding with the stagnation trend of the ISEW for Austria and a decrease in GPI in the US. They say that the EF and biocapacity reveal the different magnitude of the problem in the two countries, as reflected in the gap between GDP and ISEW (GPI). In short, Niccolucci *et al.* (2007:670) argue that the EF has already overshot the biocapacity in most western countries and this "may therefore be a reason for the decrease in welfare measured by ISEW". However, these claims re the threshold hypothesis must be examined from a socio-historical institutional analysis perspective (as prepared in *Section 4.11* below).

4.10.2 The New Critic vs. the Leading Advocate: Commentary on the Recent Debate Between Michael Harris and Philip Lawn

Harris, Michael (2007) "On Income, Sustainability and the 'Microfoundations' of the Genuine Progress Indicator", *International Journal of Environment, Workplace and Employment*, vol. 3 (2), pp. 119-131.

Lawn, Philip A. (2008d) "Response to "On Income, Sustainability and the 'Microfoundations' of the GPI"", *International Journal of Environment, Workplace and Employment*, vol. 4 (1), pp. 59-81.

Harris, Michael (2008) "Towards Genuine Progress on the Genuine Progress Indicator", *International Journal of Environment, Workplace and Employment*, vol. 4 (1), pp. 82-94.

---

consumption per person, and resource efficiency. Biological capacity varies each year with ecosystem management, agricultural practices (such as fertiliser use and irrigation), ecosystem degradation, and weather (Monfreda *et al.* 2004).

These three recent papers by Michael Harris (2007, 2008) from University of Sydney (Australia) and Philip Lawn (2008d) from Flinders University (Adelaide, Australia) evoke much cogitation about the outlook of the GPI. This (likely ongoing) debate spells major problems for the GPI and its related variants. Harris (2007) attacks Lawn's interpretation of Fisherian and Hicksian income. Lawn (2008d) counters some of the primary and secondary criticisms raised, detailing (of what Lawn sees as) the strengths and weaknesses of these two measures of income. Philip Lawn, who is the Editor in Chief of the *International Journal of Environment, Workplace and Employment*, then invites Harris back for a follow up reply, entitled "Towards Genuine Progress on the Genuine Progress Indicator". Interestingly, Lawn (2008d) submits that some elements of Harris' (2007) analysis can lead to a more robust theoretical foundation to support GPI; in other words, Lawn sees that despite the criticisms raised, there are good prospects for GPI. In contrast, Harris (2008) is more critical, arguing that there are deep-seated theoretical flaws in the structure of GPI. Note that the GPI critiques of Harris (2007, 2008) are from an orthodox (neoclassical) viewpoint, whereas Lawn (2008d) is coming from an ecological economist's position. In order to ensure a consistent flow of the most important ideas raised in the debate, the works of Harris (2007, 2008) and Lawn (2008d) are discussed in a non-rigid format.[152]

Fisher's view is that income is fundamentally experiential, while Hicks presents income in monetary terms. Fisher articulated the distinction between income-as-flow and wealth-as-stock, while Hicks focussed explicitly on the link between the two and the implications of one for the other. As noted above in *Section 4.8*, Lawn prefers Fisherian to Hicksian income because the former is purportedly more realistic for understanding sustainable economic welfare. Lawn (2008d:73) is right in saying that when valued in real terms (constant prices) Hicksian income is effectively based on the quantity of goods consumed, irrespective of their content and genuine contribution to human well-being. The GPI based on Fisherian income attempts to correct for that anomaly. Contrary to Harris' (2007:125) view, Lawn is also right when he points out that the GPI does not ignore questions of sustainability completely, since it accounts for the 'net psychic income' (ηρŷ) *and* the 'depletion flow of ecological capital' (δEκ).[153] Harris seems to confuse the two

[152] Less attention is given to Lawn's (2008) paper because he is essentially clarifying and retelling the same old argument, as that which is discussed in *Section 4.10.1*.

[153] Lawn and Clarke (2008b) in "In Defence of the GPI" make a similar point. In the GPI, the adjustment for the 'cost of lost natural capital services' is effectively equal to (a part of) the cost of natural capital depletion. But, *merely* counting the cost of the various natural capital services lost in the provision of welfare-yielding goods is an underlying problem of GPI. In Lawn and Clarke's (2008b:81) words, "[t]he GPI should ... be strictly regarded as more of a 'welfare' indicator than a 'sustainable welfare' indicator". However, GPI does ... incorporate a sustainability element insofar as the estimated costs of environmental degradation ... have been calculated on the premise that

somewhat. As clearly exemplified in Brennan (2008:7), these two components of ISEW make up the second theoretical foundation of 'entropic net psychic income'.[154] Harris is also unfamiliar with the other (perhaps) richer theoretical foundations supporting the GPI/ISEW (see Brennan 2008). Nonetheless, Harris argues that the "theoretical microfoundations" of GPI are unsound; in effect, he is commenting on the income (namely, 'ŋρŷ') aspect in his 2007 paper and the entropy ('δEκ') dimension in the 2008 paper.

Lawn's adaptation of the service flow aspect of Fisher's psychic income is problematic. This is because he misreads some of Fisher's latter views and some of Hicks' original thoughts on the theme of 'avoiding impoverishment' (see Harris 2007:122). James Tobin (2005a:212) notes that Fisher relented late in life, agreeing that *capital accumulation or decumulation* was important to pay attention to in a measure of income—an analogous conclusion reached years earlier by John Hicks. Thereby, a half-baked interpretation of Fisherian income—income as the net psychic service flux (ŋρŷ) from human-made capital—says little about what might happen to consumption in the future. This measure of 'genuine progress', in the derisive words of Harris (2007:125), simply involves "the extensive recalibration of a product-based measure [of GDP,] in such a way that it tells us something about something more closely about [sic] currently experienced economic welfare". In other words, Harris is saying that *Lawn's approach* to Fisherian income cannot measure the current level of welfare (or even 'sustainable welfare' for that matter) very well, because the calculation of GPI does not consider the relationship between changes in the capital stock (i.e. accumulation or decumulation) *and* psychic service flows.

Hicksian income is (broadly) defined as the standard of living that can be conceived without lowering the achievable standard of living in the future. Hicks (1939:176) argued that income is a complex concept and not that useful a tool to help understand reality: "[t]he practical problem, as Hicks himself explicitly noted, lies in operationalising his concept using actual data" (Harris 2007:124). Lawn misconstrues the problem of translating an abstract unit (income) into a tangible actuality (welfare or psychic income), and does not learn from Hicks' preliminary investigations. "Advocates of the GPI and its variants have eschewed the intertemporal—Hicksian—emphasis on assessing the implications of current consumption on wealth and hence future consumption" (Harris

---

natural capital should be kept intact". That is, some of the impact of present activities on future well-being is at least accounted for in the GPI. They now argue that a decline in the GPI could be a reflection of 'uneconomic' GDP growth. This differs from their previous (or current?) position of saying that a declining GPI reflects (to a degree) 'unsustainable' welfare because it *has the capacity* to warn us of "unsustainability" (e.g. see Lawn 2008d:71, 2009:1899). Why do SEWI advocates keep changing their minds?

[154] This is also shown in *Chapter 3*, Eq. (3.4).

2007:127).

According to Lawn (2008d:60), Harris' (2007) paper poses the greatest credible challenge yet to the GPI. In light of Harris' (2007) argument, Lawn realises that additional psychic income and psychic outgo factors ought to be included in a measure of national income. Lawn confesses that "the failure to include changes in the *stock of human-made capital* casts doubt as to whether the GPI satisfies Hicks' central criterion. It therefore potentially weakens the theoretical case for the GPI" (Lawn 2008d:65, emphasis added).[155] However, what is missing from both authors' accounts is the rather narrow interpretation of 'wealth', i.e. there is no mention of the need to adequately account for changes in *human-health and social capitals* over real historical time, let alone placing them in a specific socioeconomic system. These ideas are pursued and refined in *Chapter 6*.

The second main argument of Harris (2008) relates to the entropy ('δEκ') dimension of the GPI. He questions Lawn's position: that continued conversion of natural capital to produced capital cannot be relied upon as a recipe for continued economic growth, since any conversion or transformation of matter-energy involves some loss along the way (entropy increases). Lawn's position seem impregnable *if* this were all there was. However, maintaining a standard of living is not identical to maintaining a flow of physical outputs. Moving away from reliance on tapping long-stored sunshine (in the form of fossil fuels) is a *possibility*, especially in a radically different socioeconomic system altogether (i.e. social, rather than, private-for-profit control over depletable-energy-systems). Separately, Harris (2008:90) raises the same critique that David Schwartzman (2008) puts forward, that there are prospects for a solarised economy (albeit Harris ignores the capitalist system and the role of institutions in GDP growth). "Hence, the *existence* of entropy itself does not, in and of itself, provide an open-and-shut case for moving to a steady-state economy" (Harris 2008:90). As a result, Harris doubts how inferences about threshold-crossing can be drawn from observation of a GPI. "Downturns in measured GPI series may, possibly, be reversible, without downsizing to a steady-state economy" (Harris 2007:126).

In one sense, Harris is potentially right, and so a key question arises: What is the implication for the '*entropic* net psychic income' theory? Note that the main role of *Chapter 3* (à la Brennan 2008) is to *interpret* and apply theory to the existing literature, and put forward *a* 'macrofoundational' critique pertinent to the three theories. It was impossible to solve all of the theoretical concerns in the one

[155] He concludes, "changes to future welfare possibilities brought about productivity gains embodied in newly created human-made capital should in some way be incorporated into the GPI. But the GPI should not be rejected because, like any other measure of income, it fails to satisfy Hick's central criterion" (Lawn 2008d:78).

paper/chapter; in fact, our stated goal was to present the SEWIs in their best possible light. But we suspected that the three theories, especially the one developed by Lawn, have some weighty problems. The model of 'entropic net psychic income' holds true for an economy run on fossil fuel energy (finite reserves)—i.e. we cannot reuse waste-heat *ad infinitum* and we cannot regenerate the low-entropy energy reserve. But Lawn neglects the possible flow of energy into/out of the system, which is 'closed' but not isolated.[156] This means that *if* humanity can successfully harness solar energy, then the constraints of the Entropy Law will not present us with a problem for a very long time (i.e. at least for a couple of millennia) (see Schwartzman 2008:52-4). Chinks begin to emerge in the fabric of the 'entropic net psychic income' theory. How many more flaws will be found? An answer to this question is provided in *Chapter 6*.

To conclude thus far, Harris has problems with both components of the theory of entropic net psychic income. Why? The raison d'être of his argument is that, unlike GDP, which has a process of formal modelling, the GPI does not have such a method:

> The GPI, according to Lawn (2003), has been provided with theoretical microfoundations by being rendered *compatible with a definition*, rather than being *derived from a well-articulated model*. ... There are many widely varying indicators that could conceivably be constructed consistent with Fisherian principles, so it is hard to say why Lawn (or anyone else) would regard the GPI as the 'correct' one. [Harris 2008:86]

The sum of the choices made on the right-hand side is simply equal to the left-hand aggregate value. Harris' (2008) first point is that the GPI, ISEW etc. are based on a constructed equality (a simple arithmetic sum) and *not* on an accounting identity (an agreed upon system of rules). To put it another way, he might be alluding to what we argue: that the GPI is based on *ad-hoc commonsensical operational procedures*. His second point is also accurate, as demonstrated in *Section 4.11* below when we construct a stand-in net welfare indicator that is consistent with Fisherian principles and compare it with a SEWI. The results are very interesting because we arrive at a similar conclusion but by demonstrating it empirically.

GDP is guided by strict accounting identities that impose their own discipline. That is, national economic accounting identities are the framework for carefully constructing GDP; these identities provide a

[156] An *isolated* system occurs when energy and matter transfers in or out are closed. A *closed* system occurs when only energy (not matter) transfers. Work can be produced to recycle indefinitely by converting low-entropy, high-temperature energy (solar radiation) to high-entropy, low-temperature heat (Schwartzman 2008:52).

formal framework for making decisions about what is significant and why and how the aggregate is to be inferred. But, "[t]he creators of the GPI are not guided by any particular discipline in its construction and calculation" (Harris 2008:93). Perhaps, as Vicky Forgie (2007) argues, the most fitting answer is the need for more convention in the GPI. It will be interesting to see how well her proposal (of building an agreed upon system of rules) for GPI will pan out.

On a related link, the major argument of James Boyd from *Resources for the Future* is to aspire to and develop an accounting system, not just environmental indicators (e.g. see Boyd 2008b:5). He is advocating an anthropocentric, utilitarian approach to accounting, which requires focusing on "final" units of consumption. Boyd (2007:718-21) and Boyd and Banzhaf (2007:618) argue that welfare-based accounting for environmental goods must begin with *defensible definitions of the units to be counted*. Keeping track of these units—even without the using prices—leads to useful information, e.g. it is better to know how many cars and trucks are produced each year than not to know at all. The same is true for environmental public goods. Hence, their goal is to count nature on an equal footing with what GDP is already counting—measurement of ecological, nonmarket public goods in a way consistent with economic accounting principles (Boyd 2008a:19). In other words, the 'Green GDP' requires a clear distinction between nature's *final* outputs (which are counted) and the inputs necessary to produce them—in order to ensure internal integrity (and international comparability) of the current accounting framework. But to what extent is this method of focusing on "final" units of consumption relevant to the indicators that purport to measure sustainable socioeconomic welfare?

GDP counts only "end products", not the intermediate products and manufacturing processes used to make "final" market goods and services. The reason is that the value of the intermediate goods and processes is included in the value of the final good (e.g. a car's value embodies the value of the parts and labour used to create it). Hence, counting the intermediate goods and processes would be 'double-counting'. In an attempt to be consistent with GDP, the SEWI advocates (and the Green GDP) seem to be concerned with the outcomes of the process, rather than the process itself. In light of the above dialogue, a critical question arises: Is an endogenous change in human or social capital over real historical time an intermediate or final process? The quandary is that psychic income and outgo experienced are inextricably linked with the condition of a person's well-being (their psyche), and therefore a simple means–ends dichotomy (as used in GDP or Green GDP) may not be useful for the conceptual substructure of SEWIs. This argument is developed in *Chapter 6* because it is too complex to deal with all at once. But the main lesson about everything said so far is that

quantification for the sake of quantification will not aid our understanding of sustainable socioeconomic welfare: *institutional theory must direct the statistical work*, as discussed in *Section 4.11* below:

4.11 Deficiency of a Strong Socio-Historical Institutional Analysis and Lack of Advance in Theory

Most relevant scholars recognise the limitations of the ISEW, GPI, SNBI and YF accounting framework, pointing out numerous measurement problems (e.g. Clarke and Lawn 2008:574-5). For instance, one of the main challenges for an ISEW study is gathering the necessary expenditure and depreciation cost data to complete the net income statement. An ISEW estimate relies heavily on available statistical sources and data. Often these secondary data sources and statistics are not available, and if they are, they are only available for particular points in time, and not over the whole period of the study—a problem familiar to all the empirical studies. This is because important required data for calculating environmental and social costs may be not available or statistical values may be missing. In other words, we may be able to identify various regrettable social and environmental disservices, yet not be able to calculate them owing to data limitations. Hence, utilising Stockhammer *et al*. (1997:19) words for the general accord shared amongst the advocates, "the ISEW does not intend to simply replace GDP as a unique measure of welfare but should form part of a more holistic social reporting system". Their calculable ISEWs, GPIs, SNBIs and YFs can be of assistance, indicating net welfare trends and the significant costs borne towards the nation, despite the shortcomings.

However, how well does a combined current and future (sustainable) well-being indicator work out practically? In answer, this final major section argues that there are principal failures in the advocates' empirical analyses. A weak socio-historical institutional apparatus with a substantial lack of advance in theory curtails the aggregated net welfare index. Besides, the spotlight of the ISEW/GPI/SNBI/YF has been on measurement-technique issues, but excluding any real socio-historical institutional scrutiny. Measuring net welfare without a systematic understanding of capitalism, it is argued, has rendered the exercise unsuccessful.

It is surprising that most advocates of a combined indicator of socioeconomic and environmental well-being have not supplemented their analyses of economic growth with a strong institutional apparatus. Simon Kuznets (1966:6) argued that it was the role of institutions to condition economic growth. In a footnote, Stockhammer *et al.* (1997:33) hinted at having a more detailed institutional analysis. They alluded to social structures of accumulation theory, where the dominant set of institutions that contribute to capital accumulation are scrutinised over

40–60 years' waves. The idea behind the approach—which is similar to the French regulation school—is that a long period of stable and relatively large expansion needs an effective macro 'social structure of accumulation'.

In the US, the long wave upswing of the 1950s to 1960s (where deep recessions were absent) was produced by strong institutional clusters: the Keynesian welfare state; durable agreements between capital and labour; US hegemony; and a regulated financial system with fixed exchange rates. During this long wave upswing, these institutional forms provided financial stability and resolved conflicts between industrial capital (real investment) and finance capital. In addition, the relationship within the family was stable and relatively durable. However, the post-war set of institutions began to weaken. From the early 1970s through to the 2000s, there has been a relatively long wave downswing, where deep recessions of the early 1980s and 1990s and financial instability occurred throughout the 1990s and 2000s (see O'Hara 2006c).[157] Hence, an institutional analysis would be invaluable in a comparative trend analysis of economic growth and sustainable economic welfare.

To illustrate the trends of GDP and SEWI over real historical time, data are gathered from the US ISEW study (by Cobb and Cobb 1994) and selected US GPIs (by *Redefining Progress*) for the 1950–1998 period, where the per capita values are indexed at 100 in 1950 (the beginning year of the study period). We will also portray the respective per capita average annual percentage changes for the five measures over the 1950s, 1960s, 1970s, 1980s and 1990–1998 (where data is available). Utilising this alternative theoretical approach (social structures of accumulation theory), the 1970s–1990s is described as a period of regressive socioeconomic development, which is generally in line with the declining or flattening trend in US ISEW study and the four US GPI studies, as shown in *Figure 4.27* and *Table 4.27a* on page 239. But, large cross-variations in the five net income studies for the US are detected. For instance, the 1950s had the highest variance: the average annual growth rates in the per capita GPIs (2,3) were much higher than the ISEW and GPI 4 studies, and they completely outstripped the low growth of GPI 1. In the 1970s, the GPI 4 grew at an average rate above 1.3 percent per annum, whereas the GPI 1 experienced negative average annual growth rates (–0.9%). Even when we break down the results into a forty-year Kondratieff cycle of the 1950s–1960s and the 1970s–1980s, a degree of disparity in the average annual growth rates is evident, as shown in *Table 4.27b* below:

[157] Whether a new social structure of accumulation has been consolidated since the mid-1990s (i.e. sufficient for a long wave upswing) remains an open question within the literature, e.g. see Victor Lippit (2007:ch.3) and Terrence McDonough (2008:164-9).

Figure 4.27. A Comparative Analysis of the US ISEW and US GPIs (per Capita), 1950–1998

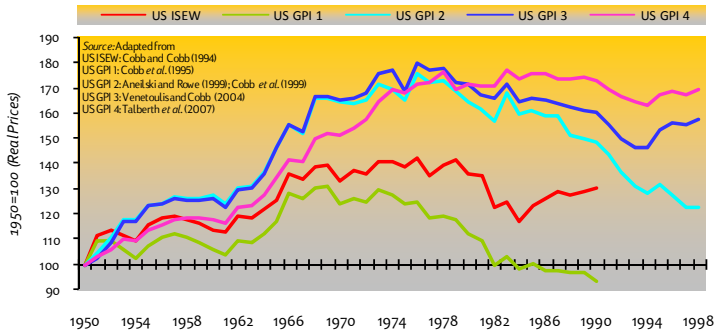


Table 4.27a. A Comparative Analysis of the US ISEW and GPIs (per Capita Real Growth Rates), 1950–1998

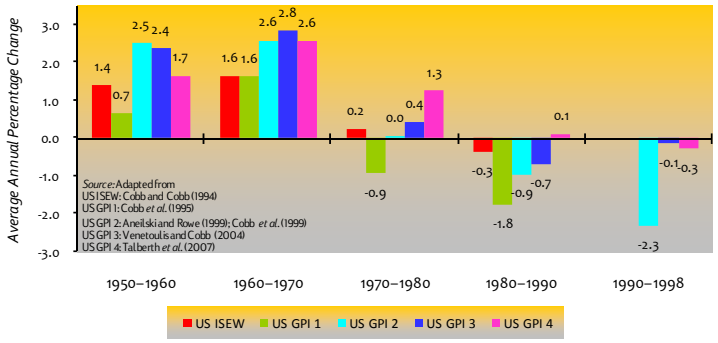
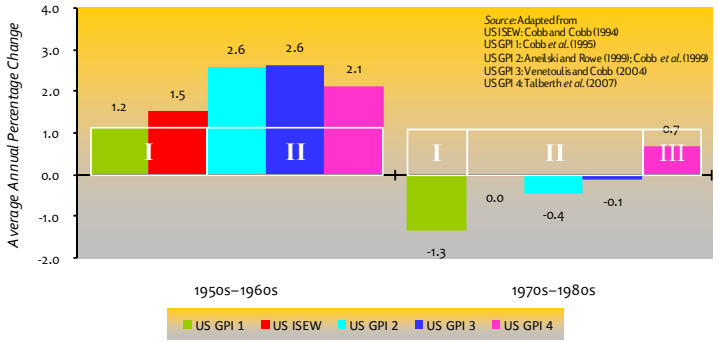


Table 4.27b. Long Wave Kondratieff Cycle of the ISEW and GPIs for the US (per Capita Real Growth Rates), 1950s–1980s



In *Table 4.27b*, there are two major variations in the long wave upswing of the 1950s and 1960s ('I', 'II'), and there are three major deviations in the 1970s and 1980s ('I', 'II', 'III'). No author has commented on the changeability of the trend results (relative to preceding *Redefining Progress* works). Nevertheless, the trends of the indicators are remarkably similar: the five studies illustrate that 1950s–1960s were much more conducive to sustainable economic welfare than the 1970s–1990s. The trends of the US ISEW and the four US GPIs tend to follow the long wave cycle of capitalist growth and development. Therefore, the studies are relatively consistent with social structures of accumulation theory, which gives

some support to the robustness of their evaluation methods. It is a shame that the ISEW/GPI advocates have a tendency to neglect history and disembody the institutions from their analyses.

Furthermore, there is irregularity present for the Australian net income indicator studies, which makes an important case study for illustrating internal consistency problems. Data are adapted from three Australian GPI studies, one YF, and one SNBI study. Because of lack of consistent time series data, we can only extract the authors' results over the 1986–1994 period. When contrasting the results, the average annual rates of change in per capita "sustainable well-being" during 1986–1994 illustrate that three major divergences are apparent, as shown in *Figure 4.28* and in the 'I', 'II', 'III' divisions in *Table 4.28* below:

Figure 4.28. A Comparative Analysis of the Net Income Indicators for Australia (per Capita), 1986–1994

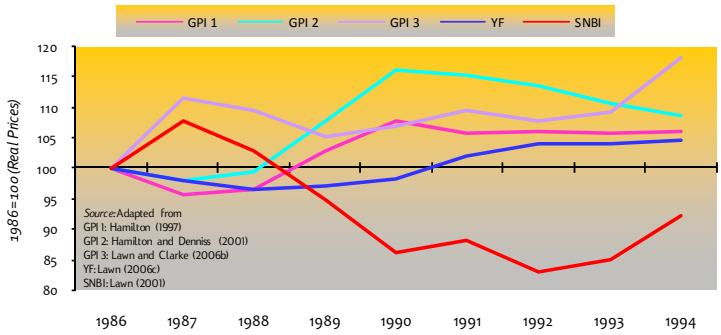
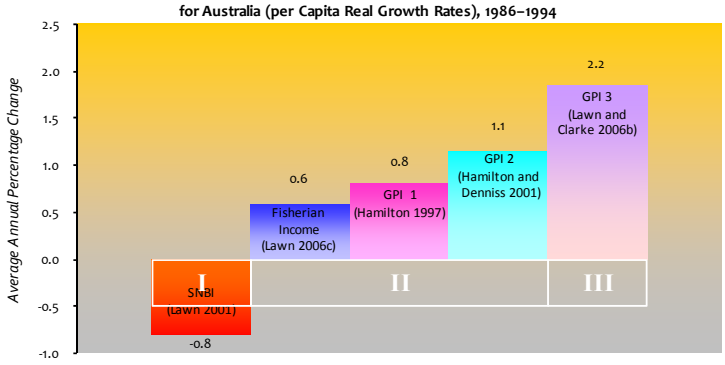


Table 4.28. 'Sustainable' or 'Unsustainable' Well-Being? Net Income Indicators for Australia (per Capita Real Growth Rates), 1986–1994



Clearly, the results describing the nature of Australian "sustainable well-being"—a term coined by Lawn and Clarke (2006b:120)—are contradictory. For instance, over the 1986–1994 period Lawn and Clarke's (2006b) GPI reveals that the average Australian is doing marvellously. Fisherian Income portrays tolerable sustainable well-being attainment. But according to Lawn's (2001) SNBI, Australians have fared dreadfully over the 1986–1994 period, 'unsustainable well-being' was realised. True,

each Australian study undertakes a different technical approach.[158] Yet, the Hamilton (1997) and Hamilton and Denniss (2001) studies show some level of uniformity even with the utilisation of different techniques. Nonetheless, the relatively wide inconsistencies in the above indicators expose the indeterminate nature of the conclusions drawn by the studies together. Therefore, given the relatively large variability of up to 3% in the average annual growth rates per capita in the Australian net welfare analyses, it is difficult to infer an upper threshold limit.

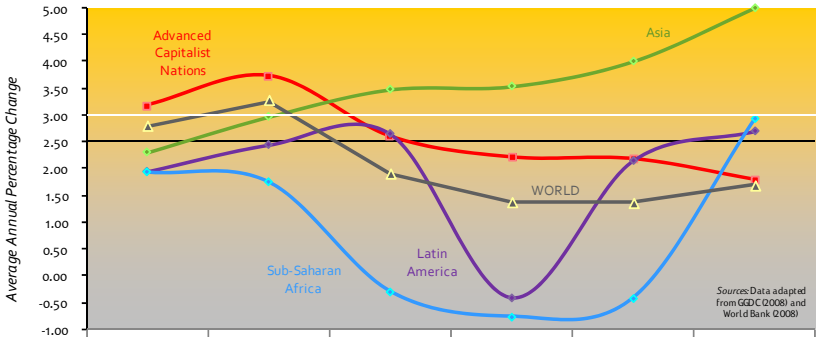
Our most important criticism is that there are some major internal inconsistencies in the explanation of the social reality. After surveying the literature, the "*solid support for the threshold hypothesis*" by Lawn (2005:186) is now shaky. Not all of the studies examined reveal that growth beyond a certain point has considerable negative costs. But, which studies do and do not support the threshold hypothesis? It is somewhat difficult to assess, namely, because of the rather vague meaning of the "threshold hypothesis"—the point where net welfare diminishes contemporaneously during the expansion of economic growth. From the advocates' viewpoint, many studies show that around the mid-1970s or early 1980s a 'threshold limit' was somehow reached: that the gap between GDP and their SEWI widened. We would generally agree that sustainable economic welfare has deteriorated over the past three decades since the early 1970s. Yet, this is an intriguing result because we are in an environment of *historically low world GDP growth*, meaning lower rates of production (creation) of marketed commodities and consumption (effective demand growth) have occurred over the last three to four decades.

The Brennan Illustrative Figure (BIF) will be utilised to organise the time-series data on GDP growth in a sophisticated way. The BIF is a dual-pane figure that combines a table and a graph in one diagram, and shows a specific critical value (or values) of importance. In this case, there are two values identified in the literature. For advanced capitalist nations, O'Hara (2006a) argues that a real GDP growth rate above 2.50 percent in per capita terms over a period of (at least) ten years is sufficient for a long wave upswing—because the major institutions are promoting a *relatively* embedded social structure of accumulation. The United Nations argues that growth in real GDP per capita above 3.0 percent is the minimum rate necessary in order for a developing country to make a dent in poverty (e.g. see UNDESA 2006:62). Utilising a BIF and arranging (where possible) the data into six successive decades during 1950–2007, the average annual percentage changes of real GDP per

[158] Obviously, most of the difference between the indices can be explained by the different approaches towards measuring and estimating the various cost/benefit components.

capita for the world and four selected areas are shown in *Figure 4.29* below:[159]

Figure 4.29. Real GDP per Capita Growth Rates for the World and Selected Regions, 1950–2007



	1950s	1960s	1970s	1980s	1990s	2000s
Adv. Cap. Nations	3.19	3.74	2.60	2.21	2.18	1.79
Asia	2.31	2.97	3.48	3.54	4.01	5.00
Latin America	1.94	2.44	2.65	-0.42	2.14	2.70
SSA	1.94	1.76	-0.29	-0.76	-0.42	2.93
WORLD	2.79	3.26	1.91	1.38	1.37	1.69

Real world GDP growth per capita was strong during 1950–1969 (average annual change 3.03%), when the advanced economies and the majority of peripheral countries enjoyed growth from a *relatively* stable macroeconomic environment. During the 1970s–2000s, no *region* apart from Asia has been able to expand *and* uphold their growth opportunities. Advanced capitalist economies had their major breakthrough of high growth of real GDP per capita in the 1950s and 1960s, with an average rate of 3.46% per annum (easily a long wave upswing). Latin America had only one decade of high growth in the 1970s, coinciding with the surge in international bank lending. SSA has yet to experience a sustained GDP growth phase in the last six decades, albeit recuperating a bit (on average) in 2000–2007[160]. Average decadal GDP growth in the economies of Latin America and SSA during 1950–2007 was never greater than 3.00%, the amount needed for sustained

[159] In this study, 'advanced capitalist nations' include most of Western Europe and its Offshoots (North America, Australia, New Zealand), and Japan. The category excludes Southern Europe due to their higher levels of familial (i.e. less market-based) capital, and the fact that uneven development persists within some of these countries (e.g. South v North Italy). In general, 'Asia' includes all areas within the continent, not including Japan, Central Asia and Australasia. 'Latin America' excludes the Caribbean and Cuba. Sub-Saharan Africa (SSA) consists of the Central, Eastern and Southern areas, including South Africa (unless otherwise stated). (Western Africa is excluded from our SSA category.) For each region, an unweighted average is calculated. The *World Development Indicators* (WDI) by the World Bank (2008) have data on annual % Δ of GDP per capita (constant 2000 US$) for (most of) the 1960–2007 period. In order to promote historical continuity, data from alternative sources on the annual % Δ of GDP per capita (1990 Geary Khamis $) were utilised for the 1950s period, and any missing values in the WDI database were substituted. The compositions of regions are derived from the country categories in "The Total Economy Database" by GGDC (2008).

[160] *N.B.* It is not the whole decade yet and we still have 2008–2010 to include figures.

poverty reduction. The standout is Asia, which experienced remarkable real GDP growth rates per capita, for example, at an average rate of 4.18% per annum during 1980–2007. But this has not been enough to stimulate world growth.[161]

There are several good institutional explanations for the declining world growth rate since the early 1970s. During the 1950s and 1960s, global GDP growth was fostered by the Fordist system (e.g. mass creation, utilisation of oil, coal and the combustion engine of production), financial regulations and social protection measures. Fordism matured in the early 1970s, which led to numerous problems and to a paradigm shift of 'neoliberalism'. Neoliberalism entails the ending of the state's regulatory interventions, allowing free markets to take on more control and reduce the power of labour. *The deregulation of global assets has inhibited real economic growth*. This is a crucial problem, yet many SEWI advocates simply leave out an analysis of the endogenous processes of capitalistic GDP growth as historically determined.

That is, "financialisation" and the subsequent rise of inequality in the US (for instance) have been on balance a *detrimental link to GDP growth* (Perelman 2008).[162] Austere global income policies, labour market flexibility coupled with a reduced role of the state during the 1980s, 1990s and 2000s have operated as a stabilising mechanism for industrial profits. The evidence by Argitis and Pitelis (2006) shows that a 'rentier trap' might have been (is) an obstacle to high GDP growth and to full employment in areas that have experienced neo-liberal policy transformations. Open market policies "have contributed to the creation of a global "rentier-led low growth and instability" regime in which financial and rentier interests have set limits to industrial investment, employment, growth and overall economic performance and a reliance on global wealth creation through outsourcing in the developing countries" (Argitis and Pitelis 2006:77). The normal path of the mature capitalist economies, such as those of the US, the major Western European countries, and Japan, is not based on *sustained* GDP growth. Today's periodic crises, instead of comprising short-term interruptions in a process of accelerated advance, indicate serious and growing long-term constraints on industrial investments (Foster 2008:10). It is interesting

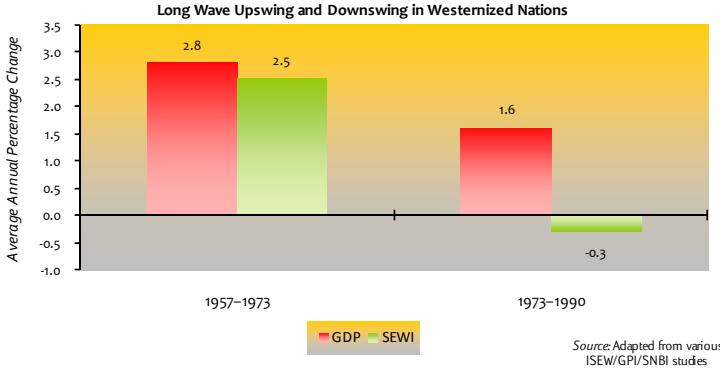
[161] Latterly, sub-prime mortgage crises and the end of private consumption expenditure fuelled by cheap credit have resulted in lower than expected US GDP growth rates and weak import demand. There are major limits to export-led growth (Hung 2008)—a paradigm that emphasises becoming internationally competitive and relying on export markets is problematic in a world-economy of low (historically speaking) growth of real GDP per capita.

[162] From the 1970s, the increasing trend to "financialisation" and changes in the pay structure of managers (for example, stock options) has had a *negative impact* on industry and the rate of accumulation in US, UK, and France (see Stockhammer 2004:738). Binswanger (2004) shows a similar breakdown between the stock market and real investment in other countries and regions, namely Canada, Japan and the European economy. Since the 1980s, the Granger-causality regressions fail to establish any significant relation between stock returns and growth rates of real economic activity.

that merely one set of SEWI advocates looked at the finance–industry contradiction, and yet this very brief analysis of the global financial system dynamics has shown that *it is erroneous to overlook its destruction effects on sustainable economic welfare*. Moreover, in general SEWIs view problems in a national-centric fashion, which is not a useful approach.

Therefore, the crux of the problem is that SEWI advocates ignore the *real* socioeconomic and institutional processes of the global capitalist system. They have ignored the fact that since the early 1970s westernised nations were undergoing a long wave downswing: conditions of relatively *low* world income growth. Recall that SEWIs are (in the main) *flow*-based indicators *not* stock-based. Hence, a comparative analysis between the *flows* of GDP and SEWI over real historical time is valid. Utilising the advocates' data on the average annual rates of change in per capita GDPs and SEWIs over the late 1950s to late 1980s lends less support to the so-called 'threshold hypothesis'. Only those national studies that had sufficient data on GDP and SEWI over the 1957–1990 period could be selected: US ISEW (2); UK ISEWs (1, 2); Dutch ISEW (1); Swedish ISEW; Austrian ISEW; US GPIs (1, 2, 3, 4); and the Australian GPIs (1a, 1b). Once the data is collated into a table, the results are remarkable. Sustainable economic welfare was rising in a *high* world GDP growth environment of more than 2.50 percent per person on average per annum (long wave upswing), and it was declining in conditions of relatively *low* world growth during the long wave downswing, as shown in *Table 4.29* below:

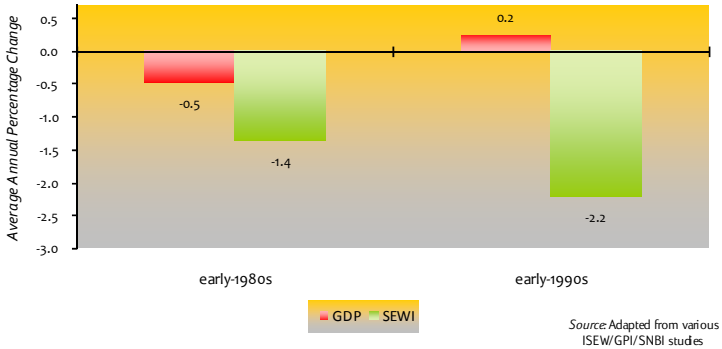
Table 4.29. GDPs and SEWIs (per Capita Real Growth Rates), Long Wave Upswing and Downswing in Westernized Nations



Source: Adapted from various ISEW/GPI/SNBI studies

Moreover, during the very low (or negative) growth rates of the deep recessions of the early 1980s and early 1990s, sustainable economic welfare was also diminishing, as shown in *Table 4.30* below:

Table 4.30. GDPs and SEWIs (per Capita Real Growth Rates), Deep Recessions of the early 1980s and 1990s in Westernized Nations



Source: Adapted from various ISEW/GPI/SNBI studies

These are extraordinary results:[163] it implies that the SEWIs do not really "debunk" GDP; the indicators look as if to go hand in hand.

Does an institutional or socio-historical account matter anyway? Absolutely, otherwise we cannot make an accurate judgement of reality; we cannot have a holistic understanding of the economic, social and ecological spheres. Yet strangely, the results boost the measurement reliability of the SEWIs, as they seem to be empirically elucidating the reality. An important question arises: To what degree would a socio-historical institutional analysis adequately supplement the net income indicators and provide integrity for the sustainable well-being indicators? Perhaps the root of the problem is that the SEWIs mesh the measurement of two separate identities: (a) *current welfare* and (b) *sustainability*. Giles Atkinson (1995:27) hinted at the problem of including both sustainability and welfare within the ISEW, but Neumayer details the conundrum (see *Section 4.9.2*). According to Neumayer (1999:95), what should be abolished is the "misplaced and misleading belief that there can be one single indicator that measures both current welfare and sustainability, which commands enough general agreement to brush away GNP from the attention of policy makers and the public". Of course, Lawn (2005:202-5, 2006a:157-60) disagrees with Neumayer's criticisms. But which premise regarding the inclusion of welfare and sustainability in the index is correct, Philip Lawn's or Eric Neumayer's?

To investigate this question, we will construct a synthetic 'net welfare index' and compare the trend of the indicator with a sustainable economic welfare index. Several simplifying assumptions are employed. The net welfare index is based on the broad category of social capital as a proxy for the "quality of social relationships" (Daly and Cobb 1989:161).

[163] In *Table 4.30*, only those national studies that had sufficient data on GDP and SEWI could be selected. For the early 1980s period: US ISEWs (1, 2); German ISEW; UK ISEWs (1, 2); Dutch ISEW (1); Swedish ISEW; Austrian ISEW; Italian ISEW; US GPIs (1, 2, 3, 4); Australian GPIs (1a, 1b); and the Australian SNBI. For the early 1990s period: UK ISEWs (2); Dutch ISEW (1); Swedish ISEW; Austrian ISEW; US GPIs (1, 2, 3, 4); Australian GPIs (1a, 1b); Australian GPI (2); and the Australian SNBI.

By design, our synthetic index excludes 'sustainability items', such as the depletion of ecological capital, as well as the components of final artefact and durable fixed business capital. In other words, only the monetary-based variables that relate to the 'social' aspects are selected. A net social capital index is devised by utilising the following sources that have sufficient data: the US GPI (Anielski and Rowe 1999, Cobb *et al.* 1999); US GPI (Talberth *et al.* 2007); the Australian SNBI (Lawn 2001); and the Australian GPI (Lawn and Clarke 2006b). The purpose is to highlight major problems when one incorporates welfare *and* sustainability within an aggregated-index.

Firstly, determining the services and disservices flowing from the stock of social capital is required to construct the synthetic net welfare index. The services flowing from social capital vis-à-vis the GPIs or SNBI components include household and volunteer labour, non-defensive private health and/or education expenditures, and perhaps leisure. The disservices flowing from the stock of social capital within the GPIs or SNBI components include the following: family breakdown; crime; defensive private health and education expenditures; underemployment; commuting costs; and perhaps lost leisure time. *Redefining Progress* perceives the above positive and negative items to be "social dimensions". The inclusion of the above items for our *net social capital index* is reasonable, but obviously, "social capital" is a much more meaningful concept (e.g. see Carroll and Stanfield 2003). In addition, we are confined to monetary-based expenditures. Thus, subtracting the disservices from the services derives a rather crude proxy for the quality of social relationships.

Secondly, the net social capital indicator is adjusted by the Gini coefficient to account for inequality. It is presumed that the services from social capital are unevenly distributed amongst poor individuals, and the disservices are disproportionately borne by the poor, as in Eq. (4.3) below:

$$\textit{Net Social Capital Index} = (\hat{s}[L_t] - d\check{s}[L_t])/D*100 \qquad (4.3)$$

Where:

$\hat{s}$	=	service derived from...
$d\check{s}$	=	disservices flowing from...
D	=	income distribution index
L_t	=	non-market labour activities of "social capital"

Adjusting social capital by an index of distribution is a valid supposition, even if it is admittedly ad-hoc. The adjustment of distribution in the GPI and SNBI is well substantiated on the commonsensical method. For instance in their US GPI, Anielski and Rowe (1999) have "factored income distribution on the assumption that inequality of income directly relates to the economic welfare and *social cohesion of a society*. By doing

so, we are making an explicit ethical argument that growing income inequality represents a *social cost*" (Anielski and Rowe 1999:5, emphases added). The GPI and SNBI account for distribution by adjusting 'private consumption expenditures' via the Gini Coefficient—it is not applied to the whole index. Yet, Lawn (2005:196-7) suggests that there needs to be more debate on the issue of weighting the final value of the ISEW/GPI/SNBI via an index of distribution. Indeed, Stockhammer *et al.* (1997) multiplied their Austrian "raw-ISEW" by the index of income and work distribution. Hence, it is preferable to adjust the whole of the net social capital index by the income distribution, as in Eq. (4.3) above.

To illustrate the relative real growth rates (per capita) between the various indices over the study period, the net social capital and the sustainable economic welfare indicators are indexed to 100 at the base year. The comparative trend results of the GPI and the social capital index are remarkable, as shown in *Figures 4.30–4.33* below:

Figure 4.30. GPI and Net Social Capital Index for the US, 1950–1998

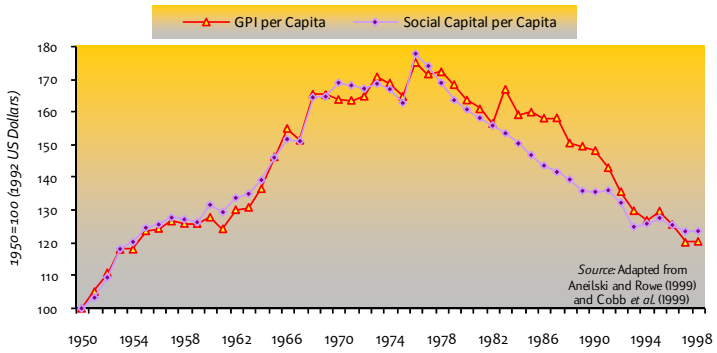


Figure 4.31. GPI and Net Social Capital Index for the US, 1950–2004

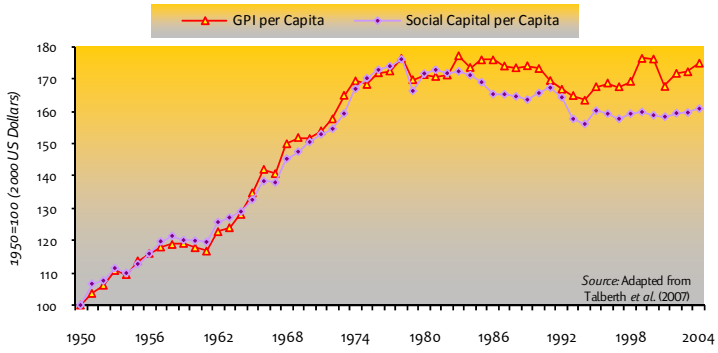


Figure 4.32. SNBI and Net Social Capital Index for Australia, 1966-67 to 1994-95

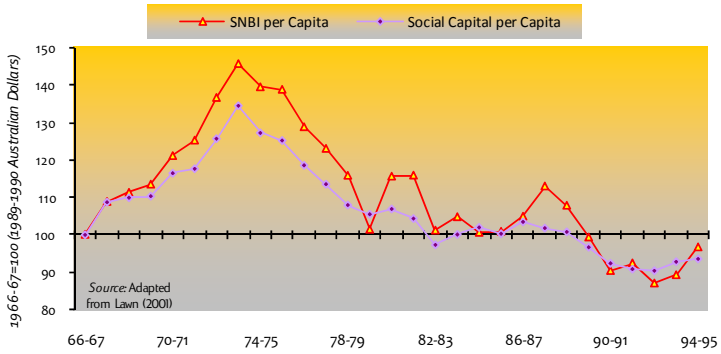
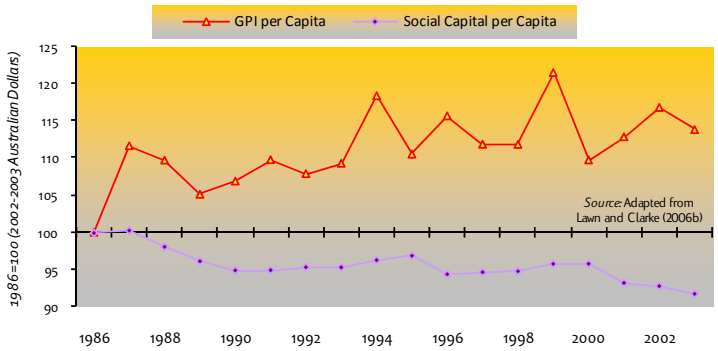


Figure 4.33. GPI and Net Social Capital Index for Australia, 1986–2003



The US GPIs and the Australian SNBI experienced virtually identical growth rates to the net social capital index (see *Figures 4.30*, *4.31*, *4.32*). This implies that our synthetic index of social capital strongly influences the trend of the sustainable economic welfare indicator. In other words, classifying and sorting the authors' data into social variables reveals that accounting for all the other items—the services and disservices from final artefact, durable fixed business and ecological capital—makes little difference to the trend depiction of "genuine progress". But it was not the case in *Figure 4.33* above: the GPI steadily increased over the period of study while social capital declined somewhat. This implies that there is a weak relationship between social capital and the Australian GPI in *Figure 4.33*. However, the widening gap between GPI and social capital may underestimate the real conditions of society: the "genuine progress" of the average Australian improved whereas there was a bit of social degradation over the 1986–2003 period. Overall, these problematic results may suggest an inherent design flaw of the procedural mechanism of the sustainable economic welfare index. Given these anomalies, how can the reader ascertain the truth of real progress from the ISEW/GPI/SNBI or YF?

Eric Neumayer expresses the problem faced by advocates desiring an omniscient all-in-one index of welfare-and-sustainability:

> The co-existence of factors within one integrated indicator of welfare and sustainability, which affect one, but not the other (or only weakly and ambiguously so), means that *as the indicator rises or falls we do not know what rises or falls*. A rising indicator could mean rising welfare and sustainability, rising welfare and a decline in sustainability (that is less in value terms than the rise in welfare) or falling welfare and a rise in sustainability (that is[,] more in value terms than the fall in welfare). Which one is not clear. The lesson is that one needs two separate indicators to trace two distinct concepts. [Neumayer 2004:5, emphasis added]

In other words, there might be a need to measure 'welfare' and 'sustainability' separately because doing otherwise yields very strange results.

On the other hand, the trend interpretation between the SEWI and GDP is (at least to some degree) notionally valid because the costs of economic growth are too unforgiving to ignore. GDP growth is simply a proxy for the rate of expansion of market relationships. GDP does not measure directly the 'consumption' (destruction) of specific durable structures over time. On its own, GDP growth only offers an indication of the creation of (market) service *potential*, or, more precisely, exchange-value creation. However, when accompanied by a story of the real workings of institutions, GDP growth *may* give us an indication of the creation of *actual* services generated in society. This is why having a strong socio-historical institutional apparatus of GDP growth is decisive, which was missing from the vast majority of the aggregate indices of ISEW and GPI. If embedded market institutions are working progressively to promote the investment (building up) of specific capitals, then GDP growth is more plausibly conducive to *actual* (as distinct to potential) 'service' creation.

Evidently, GDP growth may give a poor indication of real developmental experience, particularly at the national or subnational levels. Kerala (India) is a good case in point, renowned for its *low GDP performance* but high development of health, knowledge and community capitals. GDP and similar variables, though, ignore certain things, as the ISEW, GPI SNBI and YF rightly point out. GDP accounting does not differentiate growth from sustainable development (viz. depletion of ecological capital). Growth means a quantitative increase in the scale of goods and services (marketed dimensions) of the economy. Hence, 'growth' refers to the *quantitative* expansion in the scale of the physical dimensions of the economic system. Sustainable development means a *qualitative* improvement in the structure, design and composition of the

institutions that result from greater knowledge and understanding of social progress. *But the qualitative analysis of society, institutions, and history tends to be missing in the authors' accounts of SEWIs.* These authors want society to achieve 'sustainable development'—*a qualitative phenomenon—yet end up adopting a quantitative constant price-based measure similar to real GDP per capita*. This is inadequate to understanding capitalism.

Thus, even if the proposal of both 'welfare' and 'sustainability' is accepted in the one index, it is imperative to see how well the particular measure describes reality during the relevant trend period. There needs to be a strong socio-historical institutional analysis to support the results of GDP and SEWI. An index is completely futile without a socio-historical institutional explanation substantiating the results. Without a strong socio-historical institutional explanation *and* decomposition (e.g. *Figures 4.30–4.33*), the results in the ISEW/GPI/SNBI/YF can practically suggest anything, i.e. arbitrary conclusions. The core of the issue is that because most studies are devoid of any real socio-historical institutional analysis, the trend results are rendered much less useful.

4.12 A Summary of the Results from the Degree of Literary Contribution Scale (DLCS)

In summary, the following major types of sustainable economic welfare indicators (SEWIs) are considered in this study: Measure of Economic Welfare (MEW), Economic Aspects of Welfare (EAW); the Index of Sustainable Economic Welfare (ISEW); Genuine Progress Indicator (GPI); Sustainable Net Benefits Index (SNBI); and Fisherian Income (YF). After the MEW and EAW, the original US ISEWs generated a wave of studies estimating various net income indicators for different countries. The ISEW has been constructed for many countries, including Germany, the UK (twice), Scotland, the Netherlands (twice), Sweden, Austria, Italy, Chile, Poland (twice), and Thailand. At the national level, the GPI has been calculated for the US and Australia. In addition, the following subnational studies have come into fruition: a GPI for Alberta, Canada; GPIs for the US (Vermont, Chittenden County and Burlington); a Victorian GPI (state of Australia); a Sienan ISEW (Italian province); two regional-ISEWs for Yorkshire and Humber, and Northern Way, and the national (UK) ISEW; two Belgium ISEWs; and Chinese GPIs (four cities over three provinces). The subnational GPIs and ISEWs can allow a comparative analysis of the national net income situation. In addition, there have been several relabelled versions of the ISEW/GPI, the SNBI and YF, both calculated for Australia. As a whole, the historical applications of net income indices typically span a number of decades.

In relation to hypothesis three (H3): Are the net income indices good measures of environmental and social welfare? To answer affirmatively, it

is argued that there needs to be α), a solid theoretical foundation complemented by β), a strong socio-historical institutional analysis. In addition, it is imperative to see how well the particular SEWI describes reality during the relevant trend period; historical specificity is critical. In both of these areas, α and β, we find recurrent deficiencies in the empirical studies. However, each empirical study contributes to the literature in varying degrees. The degree of literary contribution scale (DLCS) is therefore devised to give a mark out of ten in relation to the following two areas: (α) advance in "theory"; and (β) socio-historical account vis-à-vis the SEWI. The distinction between theory and technique is somewhat ambiguous due to the prevalence of commonsensical accounting. Hence, the word 'theory' (in the DLCS) is in quotation marks. The nature of the semi-qualitative scale implies that there is a subjective element, but it is based on a comprehensive survey and critical analysis of the literature undertaken in *Sections 4.4 to 4.8*.

The lowest grade of the scale is 'poor/minor', the highest grade is 'detailed', and in the middle, 'fair' and 'good'. A score between zero (0) and three (3) says that there were only "poor" or "minor" theoretical advancements, and/or a purely descriptive analysis of the welfare periods was evident. A score above three (3) and below six (6) implies that the study was only "fair" (e.g. lacked originality in theory yet made a small contribution overall). Between six (6) and nine (9) implies that it was a generally a "good" to very good contribution (e.g. the authors in question investigated the environmental or social conditions with specificity, or that examined the relationship between economic growth and their SEWI). A score of nine (9) to ten (10) means that the level of innovation of a study was "detailed" and creative (e.g. the authors had an excellent understanding of capitalist institutions). *Table 4.31* below, on page 252, lists most of the relevant works on the MEW, EAW, ISEWs, GPIs, SNBI and YF as well as grading their contribution on the DLCS between 0 and 10 (inclusive), and provides selected brief (positive) comments on the authors' primary/new contribution. Note that the DLCS does not evaluate the criticisms/critiques raised in the existing literature or the counter-arguments from the advocates, only our criticism/critiques. This study reveals that many authors provide no major 'good' or 'detailed' advancement in theory (2.9/10); none provides a *strong* socio-historical analysis (5.2/10), as shown in the table below. Taken as a *collective body*, the mark awarded is 4.1/10, which according to the DLCS is "fair".

***Degree of Literary Contribution Scale (DLCS)*: Final Mark out of 10**																			
0	...	1	...	2	...	3	...	4	...	5	...	6	...	7	...	8	...	9	...	10
Poor/Minor						Fair						Good/Very Good						Detailed		

Table 4.31. A Summary Analysis of the Contributions of Net Income Indices

Author(s)/Category	Country/ Region(s)	Advance in "Theory" (α)	Socio-Historical Analysis vis-à-vis SEWI (β)	*DLCS*: (α+β)/2	Selected (*) Brief Comments on Authors' Primary/New Contribution
Measure of Economic Welfare (MEW)					
Nordhaus and Tobin (1972)	US	2*	0	1	A significant study on net income indicator construction.
Economic Aspects of Welfare (EAW)					
Zolotas (1981)	US	2.5	4*	3.25	A good historical analysis of the social problems in the US.
Indexes of Sustainable Economic Welfare (ISEWs)					
Cobb (1989) in Daly and Cobb (1989)	US	6*	6.5	6.25	The first ISEW study, with the development of the notion of the "economics for community".
Cobb and Cobb (1994)		3	2	2.5	
Diefenbacher (1994)	Germany	0	7.5*	3.75	A good comparative analysis between Germany and the US ISEW.
Jackson and Marks (1994)	UK	3	3*	3	First UK ISEW study.
Jackson *et al.* (1997)		1	2	1.5	
Moffatt and Wilson (1994)	Scotland	0	2*	1	First ISEW for Scotland.
Rosenberg *et al.* (1995)	Netherlands	0	1*	0.5	First ISEW for the Netherlands.
Jackson and Stymne (1996)	Sweden	3	8*	5.5	A good comparative analysis between the UK ISEW and the Swedish ISEW, i.e. different social and environmental policies influenced the ISEW trend.
Stockhammer *et al.* (1997)	Austria	8*	5.5	6.75	Notion of "potential defensive expenditures" established. Improved inner consistency and clarity in the conceptual structure of the ISEW.
Guenno and Tiezzi (1998)	Italy	1	2*	1.5	First ISEW for Italy.
Castañeda (1999)	Chile	0	6.5*	3.25	First ISEW for a newly-industrialised country, Chile.
Gil and Sleszynski (2003)	Poland	1	3*	2	First ISEW for a country in transition to a market economy.
Prochowicz and Sleszynski (2006)		0	4	2	
Clarke and Islam (2004, 2005a), Clarke (2006b)	Thailand	8	8*	8	A detailed account of Thailand's socioeconomic situation via a *decomposition* of the aggregated-index.
Bleys (2007a, 2007b)	Netherlands	0	2	1	The second study of the Dutch ISEW.
Genuine Progress Indicators (GPIs)					
Cobb *et al.* (1995)	US	7*	6.5	6.75	*The GPI by *Redefining Progress* is an important attempt to 'socialise' the ISEW (e.g. includes volunteer labour) and accounts for social breakdown (e.g. divorce). *A brilliant socioeconomic inquiry into the real processes affecting American children. *A very good critical analysis of the GPI/ISEWs and the degree of economic openness.
Anielski and Rowe (1999)		0	6	3	
Cobb *et al.* (1999)		0	8.0*	4	
Cobb *et al.* (2000)		0	7.5	3.75	
Cobb *et al.* (2001)		0	7.5	3.75	
Venetoulis and Cobb (2004)		0	4	2	
Talberth *et al.* (2006), Talberth *et al.* (2007)		7*	6	6.5	
Hamilton (1997, 1999)	Australia	8*	6.5	7.25	Attempted to embed GPI in a strong sustainability framework.
Hamilton and Denniss (2001)		5	5.5	5.25	
Lawn and Clarke (2006b), Clarke and Lawn (2007)		7	7.5*	7.25	A good deconstruction account of the GPI vis-à-vis the Australian natural landscape.
Subnational GPIs and ISEWs					
Anielski (2001)	Alberta	3	6.5*	4.75	A sophisticated set of GPI accounts developed and scrutinised.
Costanza *et al.* (2004)	Vermont, Chittenden County and Burlington (US)	0	8*	4	A good comparative subnational–national analysis: Vermont's progressive stance on the environmental policy shows that relative sustainable well-being is better than the US GPI.
Clarke and Lawn (2005) Lawn and Clarke (2006a, 2006b)	Victoria (Australia)	7	8.5*	7.75	Excellent eco-historical assessment of the Rest-of-Australia versus the Victorian situation.
Pulselli *et al.* (2006)	Siena (Italy)	0	8*	4	Compared Siena's local environmental situation (vis-à-vis natural resource dependency) with the Italian ISEW.
Jackson *et al.* (2006)	Yorkshire and Humber, Northern Way, UK	2	6*	4	A good analysis of the absolute values changes of the regional versus the national.
Bleys (2006a, 2006b)	Belgium	0	2.5*	1.25	First ISEW for Belgium.
Bleys (2008)		3	1	2	
Wen *et al.* (2007)	Suzhou, Yangzhou, Ningbo, and Guangzhou (China)	2.5	7.5*	5	An excellent ecological inquiry into the four provinces of China.
Sustainable Net Benefits Index (SNBI)					
Lawn and Sanders (1999), Lawn (2001)	Australia	8.5*	6	7.25	SNBI embedded in entropic net psychic income. Explicitly separated 'benefit' and 'cost' accounts.
Fisherian Income (YF)					
Lawn (2004b, 2006c)	Australia	8.5*	7.5	8	YF is shown to be superior to Hicksian Income.
TOTAL: (Average out of 10)	All of Thirty-Seven Studies	**2.9**	**5.2**	**4.1**	Overall Mark = 'Fair'

In other words, many studies have not bothered to theoretically explain their work. This conclusion should not be too surprising given that we have had to deconstruct the theoretical framework of ISEW in the previous chapter. According to Lawn (2005:188), "the ISEW and GPI basically differ in name only". This statement is not quite true and highlights Lawn's lack of profundity in the social realm— originally the GPI was an advance in principle as it accounted for more *social* welfare terms, even though the attempt was inadequate. Actually, the introduction of Fisherian psychic income has disconnected the meaning of the services to persons-in-community. Not even one study took into consideration Daly and Cobb's "economics for community" framework. Nevertheless, despite the attempt to 'socialise' the ISEW, to some degree the claim that the ISEW and GPI differ in name only is correct—but for different reasons to which Lawn would proclaim. Besides the few studies stipulating that their measure is entropic net psychic income, both indices are construed in the same way: a sort of *commonsensical operational procedure* anchored in a simple *plus-minus technique*. The majority of studies had no theory or made insignificant theoretical advances; they were primarily based on commonsensical accountancy.

In addition, the nature of the inquiry for most of the studies is without adequate critical analysis of real socio-historical processes vis-à-vis their index. In political economy, a detailed socio-historical institutional analysis is critical, i.e. no less than a score of '9' or above in *Table 4.31*. Only ten out of the thirty-seven studies showed a relatively good ecological-historical account (a mark of 6 and above). The majority of studies (twenty-seven) reduce the overall quality of the research; not much can be said for a detailed *socio*-historical account. As a whole, the supporters, particularly Philip Lawn, have been successful at integrating ecological economic principles into the SEWI literature. However, the problem is that a *raw* ecological economistic approach is undertaken, which limits the approach of the study into the territory of strong sustainability. Therefore, it is difficult to have much faith in the ISEW/GPI/SNBI/YF describing accurately and measuring social and ecological change, because significant conceptual and empirical inconsistencies mar the results.

4.13 Conclusion

This chapter has exhaustively reviewed the literature on thirty-seven empirical studies and on other relevant works of sustainable economic welfare indicators (SEWIs): MEW, EAW, ISEWs, GPIs, SNBI and YF. The two main conclusions in this study are that: 1) there has been a considerable lack of advance in theory throughout the period of study (from 1972 to April 2009); and 2) no study has offered a *strong* socio-historical institutional account vis-à-vis their index of sustainable well-

being. On these terms, hypothesis H3 is rejected; net income indices have not been successful measures of environmental and social welfare.

In all of the ISEW studies, there is *no* conceptual support given to the empirical and historical applications of Daly and Cobb's (1989) "economics for community" theory. Only a few studies have contributed to the SEWI's theoretical foundations (e.g. the SNBI and YF). The majority of empirical studies have not theoretically advanced their ISEW since Daly and Cobb (1989). Besides, the main 'theory' of the national GPI is based on a bookkeeping procedure of *commonsensical accountancy*. The theoretics behind the subnational GPIs are also based on the same mechanical operational procedure. Consequently, there are zero theoretical advances in almost all cases of the GPIs.

The index is impressive on paper; however, a low degree of detail in a socio-historical institutional account reduces the overall effectiveness of the aggregated welfare–sustainability index. Alas, this is a common characteristic of the studies on SEWIs and truly raises credibility issues with the *aggregated all-in-one* measures: Can the reader trust the results in representing the social reality or describing the conditions of society? To what degree do the ISEW, GPI, SNBI or YF describe the underlying socioeconomic evolutionary patterns? How can one explain the results over the business cycle or over long waves of growth and development? The answer to these questions is a difficult task.

Yet, there needs to be a *strong* socio-historical institutional analysis to support the results. Most authors do not scrutinise the long-term trend of their SEWI vis-à-vis the expansionary and recessionary periods of economic growth (GDP growth) during historically interesting epochs (e.g. the 1960s vs. the 1980s). A large number of studies provide no construal of the downturns (or upswings) of the business cycle *vis-à-vis* the degradation or enhancement of social and environmental development. Effectively, the authors' empirical applications have delinked *the GDP* from the capitalist system: a lack of historical specificity vis-à-vis the cyclical situation leaves the reader uninformed. An imprudent application of the real socioeconomic processes of capitalism is the usual outcome when there is too much focus on 'the gap' between GDP and the SEWI.

Of course, some studies have provided a reasonably good socio-historical analysis. But in the main, the better analyses were related to their *disaggregated* accounts and/or with respect to their comparative analyses between the national and subnational levels. We learn that if there is any great value to the SEWIs, their merit lies in the disaggregated account (and not in a combined index). Disaggregating the SEWI components and utilising socio-historical evidence yield more interesting results when observing social groups than adhering strictly to the indicator as a whole. At the aggregated level of investigation, however,

there is a tendency for the authors to be uninterested in the relative growth trends between GDP and their net income indicator. They inadvertently show the limitations of constructing an all-in-one indicator of "genuine progress": the authors had a far superior disaggregated account of real socioeconomic processes and institutions to their aggregated inquiry.

In conclusion, a weak socio-historical apparatus is prevalent to the majority of national *and* subnational analyses, and there is a serious lack of advance in theory. It is argued that an index is completely futile without strong conceptual and socio-historical institutional explanations substantiating the results. The problematic of the all-inclusive indices is strengthened through our applied empirical investigations. We found that without an institutional explanation *and* decomposition, the results of SEWIs could practically suggest anything. The net income indices are not very good measures of environmental and social welfare (H3).

But, it is difficult to distinguish between techniques (or methods) and the theory of the net income indicators. The strongest case for the continuation of the SEWIs is in the advocates' refinement of the benefit/cost variables comprising their measure. We came across some very good and innovative solutions proposed by the advocates. However, it would have been too complex to review such matters in this chapter. *Chapter 5* will complete the literature survey, where a cavernous inspection of the technical foundations of the SEWIs is undertaken.

Chapter 5.
A Technical Survey of Net Income Indices

5.1 Introduction

As argued in *Chapter 4*, there is a fine line to be drawn between theory and techniques of the net income indicators. Perhaps the strongest case for prolongation of the net income indicators is in the advocates' refinement of benefit/cost variables comprising their measure. Some of the advocates have made some very good contributions in this area. But it was too complicated to appraise such matters in the previous chapter. *Chapter 5* will complete the literature survey, whereby a deeper scrutiny of the technical foundations of the net income indices is carried out.

Directing the second part of the literature survey, the following hypothesis four (H4) is scrutinised:

> H4: Net Income Indices are innovative measures of welfare and capable of improvement.

This chapter is a *technical* literature review of the MEW, EAW, ISEWs, GPIs, SNBI and YF. The objective is to provide a detailed historical account of the *a priori* inclusion and exclusion of variables in these *Sustainable Economic Welfare Indicators* (SEWIs). The valuation and estimation methods employed are considered as well. But the controversies surrounding the choice of valuation methods are not detailed in this survey. Critics, namely Eric Neumayer, Giles Atkinson and Nicolas Crafts, disagree with some of the valuation techniques utilised by the authors of net income indicators. In reply, advocates Philip Lawn, Matthew Clarke and John Talberth have addressed some of the measurement problems. Indeed, Lawn dedicates numerous journal articles debating these matters. We briefly reviewed the criticisms and responses in *Chapter 4*. Valuation problems have been extensively discussed in the existing literature. In this study, the most important theme is the *relative degree of technical contribution* vis-à-vis the original foundation of the US ISEW by Daly and Cobb (1989, 1994). Hypothesis four, H4, is utilised as a guide to evaluate this theme in some detail.

The choice of variables is an important sub-genre that no author has critically examined. In this study, alphabetical symbols (a,...az) and short-hand formulae are utilised to describe each variable. There are fifty-two relatively distinct variables encompassing the net income indices, which are categorised into the broad economic, social and environmental dimensions, as shown in *Table 5.1* below:[164]

[164] Note that '*P*' (in italics) stands for private or personal related behaviour. Italicised '*B*' and '*G*' respectively signify business (or industry) and government (or public) related activities.

Table 5.1. The Complete Set of Components Utilised in the Net Income Indices

Symbol	Variable	Description of the Economic, Social and Environmental Items
		Additions
a	ŝ*P*CE	Services from personal (private) consumption expenditures
b	ŝCD_K	Services from the stock of consumer durables (final artefact capital)
c	ŝGF_K	Services from durable fixed public capital
d	ŝ*G*E	Services of non-defensive public (government) expenditures
e	ŝ*G*heedE	Services of non-defensive public expenditures in health (he) and education (ed)
f	ŝHh_t	Services of household labour
g	ŝ$FamCare_t$	Services of parenting and eldercare
h	ŝVol_t	Services of volunteer labour
i	ŝ$Leis_t$	Services of leisure labour
j	ŝ$HhFam_t$	Services of household work and parenting
k	ŝCSeq	Services of carbon sequestrations
		Subtractions
l	CDE	Consumer durable expenditures
m	*PG*DebtE	Private and public debt expenditures (outlays)
n	dš*P*Urban	Disservices of the disamenities of urbanization (private level)
o	dš*P*AuAccĎ	Disservices of auto accidents (private defensive expenditures on vehicle damage)
p	dšAuAcc	Disservices of automobile accidents and human injuries
q	dš*P*Cm_t	Disservices of private commuting
r	dš*P*heedĎ	Disservices of defensive expenditures on private health and education outlays
s	dš*P*CrĎ	Disservices of defensive expenditures on crime prevention (private level)
t	dšAd	Disservices of advertising
u	dšFamBr	Disservices of family breakdown
v	dš$Leis_t$	Disservices of lost leisure time
w	dšUe_t	Disservices of unemployment
x	dšUde_t	Disservices of underemployment
y	dšOvW_t	Disservices of overwork
z	dš*B*WAcc	Disservices of industrial (work) accidents
aa	dš*B*SexW	Disservices of commercial sex work
ab	dš*G*Cor	Disservices of public corruption
ac	dšGamE	Disservices of problem gambling expenditures
ad	dšSu	Disservices of suicide
ae	dš*P*PollĎ	Disservices of defensive expenditures on household (private) pollution abatement
af	dšNoiPoll	Disservices of noise pollution
ag	dšAirPoll	Disservices of air pollution
ah	dšWatPoll	Disservices of urban water pollution
ai	dšWasPoll	Disservices of municipal solid waste pollution (i.e. landfills)
aj	dšToxWasPoll	Disservices of toxic waste liabilities
ak	δ$MineE_K$	Depletion of mineral resources
al	δ$EnerE_K$	Depletion of energy resources
am	δ$TimbE_K$	Depletion of timber resources
an	δ$FishE_K$	Depletion of fishery resources
ao	δ$OzoneE_K$	Depletion of the ozone
ap	δ$SalinE_K$	Costs of salinity (depletion of agricultural yield on dryland and irrigated cropland)
aq	δ$IrrigE_K$	Costs of excessive irrigation water use (depletion of river and the surroundings)
ar	δ$ForestE_K$	Loss of native forests (i.e. deforestation of non-timber old growth forests)
as	δ$NatHabE_K$	Loss of natural habitats/areas (e.g. wetlands, mangroves and saltmarshes)
at	δ$LandE_K$	Loss of agricultural land (soil loss on cultivated land, i.e. farmland degradation)
au	δ$FuturE_K$	Long-term (future) environmental damage (via excess CO_2 role to climate change)
		Miscellaneous Adjustments (+/–)
av	δBF_K	Depreciation flow of durable fixed business capital
aw	ŋInv*PBG*F_K	Net investment of durable fixed (private, business and government) capital
ax	ŋInt	Net international position (i.e. net foreign borrowing)
ay	DI	Distribution index (adjustment)
az	EHI	Ecosystem Health Index (adjustment)

Which variables are common to the original ISEW template? What degree of innovatory practices have SEWI authors employed? To aid the investigation of this study, Venn diagrams and set theory notation are

utilised. The purpose of the Venn diagrams is to provide a visualisation of the differences between the original templates and their successive derivatives. Supplementing the Venn diagrams, detailed equations of each net income indicator are incorporated in order to promote specificity. Thereby employing these tools, we can work out the technical contribution of each study.

Chapter 5 is divided into six major sections. It is important to investigate the preliminaries. *Section 5.2* discusses the historical evolution of the basic ISEW template. The two original net income indicators, the Measure of Economic Welfare (MEW) and Economic Aspects of Welfare (EAW), are examined. Many of the initiatives undertaken by the authors of the MEW and EAW lead to the development of the US ISEW (1) by Daly and Cobb (1989) and the revised version, the US ISEW (2) by Cobb and Cobb (1994). The ISEW is the first measure of net welfare to include distribution, defensive costs, and sustainability (e.g. the costs of long-term environmental damage) in the one index. The 'US ISEW (2)' is central to our inquiry into *the degree of innovations made to the basic template*.

In relation to hypothesis H4, we are ascertaining the level of innovation(s) undertaken for each SEWI study published in the period from 1989 to April 2009. In general, the term 'innovation' entails an invention *and* implementation of a *new* way or idea of doing something. From a political economy perceptive, innovations are the radical and revolutionary changes in thinking, processes, products, or organisations (Schumpeter 1911:63-6). In this study, the introduction of a *new* variable for the *first time* would constitute an innovation. Making a significant change to an *existing* variable, strictly speaking, would not amount to an 'innovation'. Hypothetically, even though a major advance in technical methods could have been made, the variable in question (from the list in *Table 5.1*) is not radically modified or new *per se*. Nonetheless, we still should assess these types of modifications in view of providing a fair and sympathetic assessment of the net income studies.

Therefore to minimise complexity, a straightforward dual-score rating system is introduced in this chapter. The rating procedure is briefly discussed in the middle segment of *Section 5.2.3*, initially in a practical way, and then followed by the particulars of the Venn diagrams and set theory notation. In this case, I want to measure the technical advances of other studies *in relation to* the 'US ISEW (2)' *and to* the prevailing empirical material of other ISEW studies. The relative degree of contribution is thus determined by the extent to which new variables and/or considerable changes in technical methods are devised. A rating is based on the investigator's value judgements that relate to a *thorough inspection of the technical literature on SEWIs*. Limiting the rating system to a score of '1' (minor contribution) or '2' (major contribution) reduces

bias and makes it easier to clarify the level of originality embodied in the net income studies; most importantly, the reasons for a score of 1 or 2 are made explicit in the text.

Subsequently in the following five sections, the authors' innovations or enhancements achieved over the basic ISEW template are scrutinised. *Section 5.3* specifically deals with the degree of innovation made in seventeen individual ISEW studies. The US Genuine Progress Indicator (GPI) by Cobb *et al.* (1995) is a significant advance over its predecessor. *Section 5.4* verifies the evolutionary advances of the GPI over the template ISEW. In *Section 5.5*, the 'US GPI (1)' by Cobb *et al.* (1995) becomes the new template design and consequently the benchmark for comparing US GPI (1) with fourteen other GPIs. That is, the innovations achieved over the basic GPI template and the prevailing empirical material of other GPI studies are scrutinised. In *Section 5.6*, two measures that are derivatives of the ISEW and GPI are discussed. They are the Sustainable Net Benefit Index (SNBI) and Fisherian Income (YF) studies. The comparative analysis centres on the technical advances made in relation to the templates of the US ISEW (1) and US GPI (1), since these are the two foundational studies in the SEWI literature.

Section 5.7 summarises the technical survey and links the results to hypothesis four (H4). A final score (100 percent or less) in relation to the Effective Rate of Replication (EROR) is given for each study (thirty-three in total, excluding MEW and EAW). The EROR pertains to the degree of replication relative to the basic template and to the former studies. Founded on the simple dual-score rating system, EROR is a weighted summation of these individual scores. That is, studies that have a relatively *low EROR* are highly innovatory because these authors have made significant (major) technical contributions. A relatively *high EROR* is a weak (minor) contribution, as the basic template was copied, replicated. The extent of basic template replication is thus determined by the relative degree of the authors' contribution(s). EROR is a useful proxy for determining whether the 'Net Income Indices' are innovative measures and capable of improvement (H4). Interestingly, the overall total result found in this study is an EROR of about 87%. In other words, many studies slavishly follow the basic templates of Cobb and Cobb (1994) and Cobb *et al.* (1995). The high replication rate may indicate that there are major limits to fundamentally developing the ISEW/GPI, suggesting that the measures are *not* innovative, lacking the potential for improvement (H4).

In summary, this study critically evaluates the authors' relative degree of literary contribution vis-à-vis the *basic template* of the US ISEW (2) devised by Cobb and Cobb (1994) and the US GPI (1) by Cobb *et al.* (1995). With the aid of Venn diagrams, the minor and major contributions/innovations accomplished are scrutinised, beginning with

a discussion of the MEW, EAW and US ISEW (1) in *Sections 5.2.1, 5.2.2 and 5.2.3* below:

5.2 Historical Evolution of the Basic ISEW Template

5.2.1 The US MEW – Nordhaus and Tobin (1971, 1972)

One of the most original net income indicators is the Measure of Economic Welfare (MEW), developed almost four decades ago by William Nordhaus and James Tobin (1971, 1972). As mentioned in the introduction, we are employing Venn diagrams to provide a foundation for a visual comparative analysis of the thirty-five studies, beginning with the MEW. In this and the proceeding Venn diagrams, the Universal Set, *Ụ*, incorporates all of the 52 variables. However, in order to keep the diagrams as simple as possible, only certain variables of significance are highlighted. Text adjacent to the right and bottom of the figures give the full details, as expressed in standard set theory notation. In order to differentiate between the various types of components (positive or negative) in the SEWI, purple represents a 'plus' item, red exemplifies a 'minus' item, purple-red is a 'plus or minus' item. Of the 52 variables in *Ụ* (the boxed area), the eleven components, utilised in the US MEW are shown in *Figure 5.1* below:

Figure 5.1. The US MEW

KEY:
Ụ = Universal Set
= {a,...az | all the benefit and cost variables}

Template MEW = US MEW

US MEW = {a,...d,f,i,l,n,q,r,aw}

a = {ŝ*P*CE | Services from personal consumption expenditures}
b = {ŝCD$_K$ | Services from the stock of consumer durables}
c = {ŝ*GF*$_K$ | Services from durable fixed public capital}
d = {ŝ*GE* | Services of non-defensive public expenditures}
f = {ŝHh$_t$ | Services of household labour}
i = {ŝLeis$_t$ | Services of leisure labour}
l = {CDE | Consumer durable expenditures}
n = {dšUrban | Disservices of the disamenities of urbanization)}
q = {dš*P*Cm$_t$ | Disservices of private commuting}
r = {dš*P*heedD̈ | Disservices of defensive expenditures on private health and education outlays}
aw = {ŋInv*PBGF*$_K$ | Net investment of durable fixed (private, business and government) capital}

While there may evidence of *some* conceptual analysis, there is *no* definitive theoretical framework for this indicator. The authors prefer MEW to start with private and public consumption expenditures, because "GNP is not a measure of welfare ... the goal of economic activity, after all, is consumption" (Nordhaus and Tobin 1972:512). Various positive

and negative adjustments to consumption are undertaken in MEW, as shown in Eq. (5.1) below:

$$\begin{aligned} MEW = {} & \hat{\mathbf{s}}[PCE + CD_K + GF_K + GE + Hh_t + Leis_t] + \eta Inv PBGF_K \\ & - \mathbf{d\check{s}}[CDE + Urban + PCm_t + P heed\check{D}] \end{aligned} \tag{5.1}$$

Services (ŝ)

*P*CE	=	personal consumption expenditures
CD_K	=	the stock of consumer durables (e.g. household appliances and furniture)[165]
GF_K	=	durable fixed public capital (government structures excluding military)
*G*E	=	non-defensive public expenditures, such as public consumption of postal services, parks and recreation programs
Hh_t	=	household labour (valued at the real wage rate)
$Leis_t$	=	leisure labour excluding instrumental maintenance items such as personal care (preferred assumption is that leisure is unaffected by technical progress)
$\eta Inv PBGF_K$	=	net investment of durable fixed (private, business and government) educational, health, reproducible and non-reproducible capital ($\Delta PBGF_K - \dot{g}^{req} PBGF_K$)

Disservices (dš)

CDE	=	consumer durable expenditures (treated as investments, 'costs'), and personal business expenses
Urban	=	the disamenities of urbanization, e.g. pollution and other negative externalities such as the higher cost of living in cities, mainly because land rents are bid up (urban wage differentials)
PCm_t	=	private commuting (one-fifth of personal transportation expenses)
*P*heedĎ	=	defensive expenditures on private health or 'medical' and education investments

They separate 'consumption', 'investment' and 'intermediate' (aka instrumental or regrettable) monetary expenditures to determine the individual contribution to welfare. The authors consider 'consumption' as a positive contribution to welfare, such as the services derived from consumer durables and durable fixed capital. By 'investment', they mean replacement monetary consumer expenditure required to replenish the damaged stock. In this case, the damaged stock or costs that require replacement are the educational and health stocks. Consequently, these 'investment' expenditures, *P*heedĎ in Eq (5.1), are deducted from the services account (because they are disservices). 'Intermediate' or 'regrettable' expenditures are the costs associated with the non-final expenditures that do not add to welfare. 'Instrumental' or 'intermediate' expenditures, such as road maintenance, general government, sanitation, and civilian safety (e.g. police services) are not direct sources of utility, but are "regrettable necessary inputs" to activities that may yield utility. Also, according to the authors, no reasonable nation purchases defence, because its services are not desired *per se*. Hence, under the '*G*E' item in Eq (5.1) the following items are excluded: national defense less one-half; atomic energy development; space research and technology; international affairs and finance; and veterans' benefits and services.

The '$\eta Inv PBGF_K$' item in Eq. (5.1), the net investment of durable fixed (private, business and government) educational, health, reproducible

[165] When typically detailing the equations in this study, information on the measurement techniques/methods are summarised in parentheses. This style was deemed more appropriate than putting it in the body-text.

and non-reproducible capital is an important dimension of economic sustainability. It is calculated by working out the additional durable fixed capital consumption minus the growth requirement for 'sustainable' durable fixed capital (i.e. $\Delta PBGF_K - \dot{g}^{req}PBGF_K$). That is, the annual increase in durable fixed capital necessary to keep up with the trend growth of labour force and productivity. "In the case of [public] educational and health capital, we have assumed the yields to be intermediate services rather than direct consumption [services]; that is, we expect to see the fruits of investments in education and health realized in labor productivity and earnings, and we do not count them twice" (Nordhaus and Tobin 1972:517). Thus, their measure understates economic welfare and its growth to the extent that education and medical care are *direct* rather than indirect sources of consumer satisfaction.

They hope to include a measure of distribution and ecological capital in future efforts. But they underestimated the significance of these components. "[N]on-appropriated resources such as water and air are used and valued as if they were free, although reduction in the per capita stocks of these resources diminishes sustainable consumption in future ... but given the size of components of [durable fixed] wealth*, we do not believe it would be significant*" (Nordhaus and Tobin 1971:A-37, emphasis added). Daly and Cobb (1989, 1994) show that depletion of ecological capital has a significant effect on the trend of the net income indicator. In addition, inclusion of leisure is a controversial item (e.g. see Daly and Cobb 1994:457). In MEW, 'leisure' and 'nonmarket work' (household labour) have a very large effect on indicator's final value. In retrospection, the MEW is significant and provided impetus for the development of other net income indices.

Interestingly, they state that they cannot estimate the externalities of 'social interdependence' (see Nordhaus and Tobin 1971:A-2). What is the degree to which increasing consumption over time is pleasurable to society as a whole? How much consumption is simply relief of artificially induced cravings nurtured by advertising and sales effort? The authors do not attempt to solve these problems in their measure; but at least in principle recognise them as a source of complexity. The Economic Aspects of Welfare (EAW) by Zolotas (1981) addresses some of these issues, as will be discussed in *Section 5.2.2* below:

5.2.2 The US EAW – Zolotas (1981)

Contrary to Nordhaus and Tobin, Zolotas (1981) focuses on the *current* flow of services and disservices, leaving out the issues of economic sustainability and capital accumulation, but giving some attention to *ecological* sustainability. While there is no theory developed for the indicator, the sixteen items utilised in the US EAW are shown in *Figure 5.2* below:

Figure 5.2. The US EAW

KEY:
Ụ = Universal Set
= {a,...az | all the benefit and cost variables}

Template EAW = US EAW

US EAW = {a,...c,e,f,i,l,q,r,t,ae,ag,ah,ai,ak,al}

a = {ŝ*P*CE | Services from personal consumption expenditures}
b = {ŝCD_K | Services from the stock of consumer durables}
c = {ŝGF_K | Services from durable fixed public capital}
e = {ŝ*G*heedE | Services of non-defensive public expenditures in health and education}
f = {ŝHh_t | Services of household labour}
i = {ŝ$Leis_t$ | Services of leisure labour}
l = {CDE | Consumer durable expenditures}
q = {dš*P*Cm_t | Disservices of private commuting}
r = {dš*P*heedĎ | Disservices of defensive expenditures on private health and education outlays}
t = {dšAd | Disservices of advertising}
ae = {dš*P*PollĎ | Disservices of defensive expenditures on household pollution abatement}
ag = {dšAirPoll | Disservices of air pollution}
ah = {dšWatPoll | Disservices of urban water pollution}
ai = {dšWasPoll | Disservices of municipal solid waste pollution}
ak = {δ$MineE_K$ | Depletion of mineral resources}
al = {δ$EnerE_K$ | Depletion of energy resources}

Similarly to the MEW, the EAW adds to and subtracts from personal consumption expenditures, as shown in Eq. (5.2) below:

$$\begin{aligned} EAW = {} & \mathbf{\hat{s}}[PCE + CD_K + GF_K + GheedE + Hh_t + Leis_t] \\ & - \mathbf{d\check{s}}[CDE + PCm_t + PheedĎ + Ad] \\ & - \mathbf{d\check{s}}Poll[PĎ + Air + Wat + Was] \\ & - \mathbf{\delta E_K}[Mine + Ener] \end{aligned} \quad (5.2)$$

Services (ŝ)

*P*CE = private consumption expenditures
CD_K = the stock of consumer durables (annual flow of services estimated over their useful life span)
GF_K = durable fixed public capital, à la collectively 'consumed' goods (namely, 50% of public buildings)
*G*heedE = non-defensive public expenditures in health and education (50% of the annual increment in per capita real public expenditure on health)
Hh_t = household labour (the value of housework per unit of time minus the service supplied by laundries, cleaners, self-service restaurants and paid domestics—since these services were previously undertaken in the home are now performed in the market)
$Leis_t$ = leisure labour (the total number of hours per unit of free time available, where leisure is treated as a final good regardless of productivity changes)

Disservices (dš)

CDE = consumer durable expenditures
PCm_t = private commuting as a proxy for urbanisation costs (the direct cost and loss of time involved when travelling to and from work)
*P*heedĎ = defensive expenditures on private health and education outlays (50% of the annual increment in per capita real private expenditure on health, 100% of private expenditures on primary and secondary education, plus 50% on higher education)
Ad = advertising, where the aim is to create an insatiable desire for new goods, thereby causing dissatisfaction with those already possessed (50% of advertising expenditures)
*P*PollĎ = defensive expenditures or 'corrective goods' on household pollution abatement, such as anti-pollution equipment and special filters for car exhaust fumes (control costs)

AirPoll = air pollution (both control and damage costs)[166]
WatPoll = urban water pollution (control cost)
WasPoll = municipal solid waste pollution (control cost)

Depletion of Ecological Capital (δE_K)

Mine = mineral resources, i.e. basic raw materials (difference between actual resource prices and imputed prices derived from the long-term interest rate and an estimated risk premium)
Ener = energy resources, including petroleum (difference between actual resource prices and imputed prices derived from the long-term interest rate and an estimated risk premium)

In Eq. (5.2), the outlays for the acquisition of consumer durables (CDE) are deducted from private consumption because they do not contribute directly to personal well-being. Zolotas recognises the problem of *technological obsolescence*, yet only to a small degree measures it. He accounts for technological obsolescence by deducting the total value of automobile production from personal consumption expenditures (see Zolotas 1981:90). It is assumed that 50 percent of advertising expenditure (Ad) is informative, assisting consumers to meet their specific wants. The other 50 percent of advertising is considered 'suggestive' with the aim of creating an insatiable desire for new goods, thereby causing dissatisfaction with those already possessed. This is a significant problem in political economy.

Zolotas (1981:86) assumes that only 50 percent of public buildings supply services that are enhancing social welfare, while the other 50 percent comprises buildings that do not contribute to social welfare either directly (e.g. penitentiaries) or indirectly (e.g. factories). The proportion of public expenditures in health contributing to social welfare is 50 percent, since the other half was reckoned as investment or corrective spending. He considers most public educational expenditures non-current service generation; hence, they are not included in the EAW, albeit they were included in the MEW. Also, expenditures on national defence, police services, fire department activities etc. are corrective or intermediate in nature. They serve to 'purchase' goods and services essential for the preservation of fundamental social values, such as personal freedom and public order. Thus, they are not included in the EAW index. Nonetheless, the private investment or corrective outlays on health and education are disservices, thereby deducted from the account of services. On the other hand, he makes no effort to quantify the private sector corrective expenditures on pharmaceuticals, handguns, alarm systems, safety locks etc., since they seem low in comparison with the corresponding category of public expenditure (Zolotas 1981:45).

The pollution borne by government or industry (business) sectors is excluded because the starting point for all calculations is real *private*

[166] Control costs are actual outlays aimed at preventing or correcting the destructive effects of pollution (e.g. domestic smoke eliminators, special filters for car exhaust fumes etc.). Damage costs are the residual amounts of social cost owing to that part of environmental pollution not affected by control costs (e.g. the damage cost of air pollution includes health problems and the spoiling of crops).

consumption (see Zolotas 1981:66). Damage costs denote the residual amounts of social cost owing to that part of environmental (e.g. air, water) pollution not affected by control costs. He accounts for the depletion of raw materials, which is a small fraction of the total ecological capital stock. Similarly to durable fixed capital, natural resources (e.g. fuel and minerals) eventually become exhaustible if the rate of exploitation exceeds the rate of replacement over a period. But natural resources are not accounted for in the production process or via the competitive market. Hence, Zolotas deems it significant to account for the depletion of energy and mineral resources in the EAW index—this is a major innovation over the MEW. The authors of the Index of Sustainable Economic Welfare (ISEW) strongly agree with Zolotas on this issue, as discussed in *Section 5.2.3*:

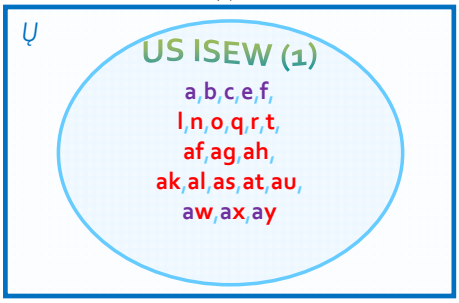
5.2.3 The US ISEWs – Cobb (1989), Cobb and Cobb (1994)

Herman Daly and John Cobb (1989) in *For the Common Good* pioneered early work into developing a more appropriate measure of sustainable economic welfare. They devised the very first ISEW for the US (see Cobb 1989). Daly and Cobb (1994) revised their book for a *Second Edition* in which they modified the index somewhat after digesting various criticisms raised by scholars (Cobb 1994, Cobb and Cobb 1994). The significance of their work is that it was the first indicator attempting to combine welfare aspects of income distribution *and* environmental destruction. Only *a part* of their ISEW is rooted in the "Economics for Community" theory, namely, it is based on the principles of internalization and strong sustainability (of human-made and natural capitals).

The spotlight of ISEW centres on measuring aspects of ecological 'sustainability'. For instance, Cobb (1989) deducts the annual loss of productive services associated with the past and present conversion of wetlands and farmlands to urban areas. He assumes that land development is irreversible because substitutes for the services of wetlands and farmland are not readily available. A marsh area converted to airport runway, for example, no longer provides present and future benefits of flood protection, groundwater purification and storage, wildlife preservation and scenic vistas. The loss of high-quality farmland to suburban development or soil erosion requires that crops be grown on less fertile fields with heavier doses of chemical fertilisers. Cobb's (1989) accounting methodology ensures escalating aggregate costs of land development over time.

Specifically, the twenty-two items utilised by Cobb (1989) in the US ISEW (1) are shown in *Figure 5.3* below:

Figure 5.3. The US ISEW (1) – the First Basic Template ISEW



KEY:
Ụ = Universal Set
= {a,...az | all the benefit and cost variables}

First Basic Template ISEW = *US ISEW (1)*

US ISEW (1) =
{a,...c,e,f,l,n,o,q,r,t,af,...ah,ak,al,as,...au,aw,...ay}

a = {ŝ*P*CE | Services from personal consumption expenditures}
b = {ŝCD_K | Services from the stock of consumer durables}
c = {ŝGF_K | Services from durable fixed public capital}
e = {ŝ*G*heedE | Services of non-defensive public expenditures in health and education}
f = {ŝHh_t | Services of household labour}
l = {CDE | Consumer durable expenditures}
n = {dš*P*Urban | Disservices of the disamenities of urbanization (private level)}
o = {dš*P*AuAccĎ | Disservices of auto accidents (private defensive expenditures)}
q = {dš*P*Cm_t | Disservices of private commuting}
r = {dš*P*heedĎ | Disservices of defensive expenditures on private health and education outlays}
t = {dšAd | Disservices of advertising}
af = {dšNoiPoll | Disservices of noise pollution}
ag = {dšAirPoll | Disservices of air pollution}
ah = {dšWatPoll | Disservices of urban water pollution}
ak = {δ$MineE_K$ | Depletion of mineral resources}
al = {δ$EnerE_K$ | Depletion of energy resources}
as = {δ$NatHabE_K$ | Loss of wetlands and farmlands}
at = {δ$LandE_K$ | Loss of agricultural land}
au = {δ$FuturE_K$ | Long-term (future) environmental damage}
aw = {ŋInv*PBG*F_K | Net investment of durable fixed (private, business and government) capital}
ax = {ŋInt | Net international position}
ay = {DI | Distribution index (adjustment)}

The starting point of the US ISEW (1) is personal consumption expenditures (*P*CE) adjusted by an index of distributional inequality (DI). From there, flows of services, net capital growth and net investment are added, and disservice flows and depletion of ecological capital are subtracted, as shown in Eq. (5.3) below:

$$\begin{aligned} ISEW = {} & \hat{\mathbf{s}}[PCE/DI{*}100 + CD_K + GF_K + GheedE + Hh_t] + \eta Inv PBGF_K + \eta Int \\ & - \mathbf{d\check{s}}[CDE + PUrban + PAuAccĎ + PCm_t + PheedĎ + Ad] \\ & - \mathbf{d\check{s}}Poll[Noi + Air + Wat] \\ & - \boldsymbol{\delta E_K}[Mine + Ener + NatHab + Land + Futur] \end{aligned} \qquad (5.3)$$

Services (ŝ)

*P*CE/DI*100 = personal consumption expenditures divided by the index of distributional inequality (low quintile option of the harmonic mean method, which emphasises the variations in the relationship between the highest quintile and other quintiles)

CD_K = the stock of consumer durables (annual flow of services derived from the stock of 'durable' consumer goods estimated over their useful life span. For each year, the total net stock is multiplied by 10%)

GF_K = durable fixed public capital (5% of gross stock of federal, state and local highways and streets, excluding military)

*G*heedE = non-defensive public expenditures in health and post-secondary education (50% for both at the federal, state and local level)

Hh_t = household labour (average wage rate of household domestic workers)

ŋInv*PBG*F$_K$ = net investment of durable fixed (private, business and government) capital (ŋġ*PBG*F$_K$ = Δŕ$_*$ŋ*PBG*F$_K$ – ŕ%ΔLaborForce$_*$ŕŋ*PBG*F$_{K(t-1)}$)[167]

ŋInt = net international position (the amount in which Americans 'invest' overseas minus the amount 'invested' by foreigners in the US)

Disservices (dš)

CDE = consumer durable expenditures[168]

*P*Urban = the disamenities of urbanization (private level) (cost of living associated with increasing density)

*P*AuAccĎ = auto accidents (private defensive expenditures) (damage of vehicles)

*P*Cm$_t$ = private commuting (direct, out of pocket costs)

*P*heedĎ = defensive expenditures on private health and education outlays (50% for both)

Ad = advertising (100% of national expenditures)

NoiPoll = noise pollution

AirPoll = air pollution of SO_2, NO_2, Particulate Matter (PM) (damage to agricultural vegetation, materials damage, costs of cleaning soiled goods, acid rain damage to forests and aquatic ecosystems, urban disamenities such as the reduction in property values, and aesthetics due to loss of visibility and enjoyment in national parks and other scenic areas) (using emission levels)

WatPoll = urban water pollution (damage from point source discharges such as sewage and industrial wastes, and damage due to siltation from erosion from farms, construction sites and roadways)

Depletion of Ecological Capital (δE$_K$)

Mine = mineral resources (via user costs)

Ener = energy (or fuel) resources (via user costs)

NatHab = wetlands (value per acre of the flow of services from an acre of wetland—a cumulative process)

Land = agricultural land (via soil degradation—due to urban expansion and poor land management such as erosion and compaction—cumulative productivity losses)

Futur = long-term (future) environmental damage (ecological disruption from the consumption of fossil fuels and nuclear energy)

Economic *and* ecological sustainability is a speciality of the ISEW in Eq. (5.3). In contrast to Nordhaus and Tobin, the authors of US ISEW (1) redefine the growth requirement as the growth of capital necessary to compensate for depreciation and population growth, without including any consideration of changes in labour productivity (see Cobb and Cobb 1994:35). 'Net capital growth' (ŋInv*PBG*F) involves adding the amount of new capital stock (increases in fixed reproducible capital) minus the capital requirement, the amount necessary to maintain the same level of capital per worker.[169] Cobb (1994:448) argues that declining productivity should expand the growth requirement, because capital must be used to compensate for reduced productivity if the same level of consumption is to be maintained. In the sustainable MEW, a fall in productivity enhances the MEW, which is an unrealistic result. In other words, Nordhaus and Tobin (1972:6) have ignored the possibility that productivity would decline, which it has during many of the years since they published their

[167] The parameter, ŕ, symbolises "rolling average of the …".

[168] Some of the "consumption" during the accounting period will relate to expenditures on durable goods from previous accounting periods. To avoid double counting, an adjustment (CDE) is made by subtracting out the actual expenditures on consumer durables. Technically, in the ISEW, 'CDE' is neither a service nor a disservice item *per se*, but it is included under the 'disservice' (dš) category to show that it is deducted from the stock of consumer durables (CDK).

[169] To sustain long-term *economic* welfare, Cobb and Cobb (1994) believe that there should be an increasing or constant supply of capital per worker. ISEW calculates net capital growth by adding the stock of new capital and subtracting the requirement of private, business, government capital. The capital requirement is the amount needed to sustain the stock of capital and, hence, the amount needed to sustain the same level of capital per worker. The capital requirement is obtained by multiplying the percentage variation in labour force by the stock of capital of the preceding year.

paper. Thus, the authors of the US ISEW (1) avow for a more conservative method by choosing to leave out productivity changes of economic sustainability altogether.

The US net international position measures the amount that Americans invest overseas minus the amount foreigners invest in the United States. The annual change in the net international position (ŋInt) indicates whether the US is moving in the direction of net borrowing (if negative) or net lending (if positive). If it is negative, part of US capital formation is in fact based on wealth borrowed from foreign interests that must eventually be repaid with interest. If the change is positive, the US has in effect increased its capital assets.

The interaction of net foreign lending or borrowing and net capital growth effectively measures the net borrowing to finance current consumption. If net borrowing exceeds net capital formation, then borrowing from overseas is for consumption purposes. If borrowed money is used for investment purposes, the negative effects of borrowing are neutralised by the positive effects of investment and the ISEW increases; but if the borrowed money is used for consumption then the ISEW declines. Annual changes in the net international position, a supposed measure of long-term viability, are therefore included.

Depletion of non-renewable natural resources such as minerals, energy, land and natural habitats (wetlands) in Eq. (5.3) represents a loss of natural capital and thus a reduction of future consumption possibilities. Consider the depletion of mineral and energy resources, for instance. Daly and Cobb (1989) wanted to utilise El Serafy's "user cost" method for relating 'true income' to total receipts from mineral production via a discount rate and the number of years to depletion.[170] The resource rent method is inspired by the idea of *sustainable income* and aims to separate sustainable from the non-sustainable income parts. That is, non-renewable resources are irreversibly lost in the process of use; non-renewable resource extraction represents the (partial) liquidation of an existing capital stock. However, due to the practical limitations of El Serafy's model, the authors of the US ISEW (1) decided to take the total value of receipts from mineral production to account for ecological capital depletion.

Under the category of agricultural land, they measure the losses in future production as a result of changes to the soil area resulting from current activities. Thus, in calculating the loss of soil productivity, they are interested in calculating those losses that result from the *future* impact of current activities. They do not subtract lost present-day

[170] The user cost: the amount of money that would need to be set aside from the proceeds of the liquidation of the assets of ecological capital to generate a permanent income stream that would be as great in the future as in the present. Rental income accrues from resource extractions, therefore this is 'non-sustainable' into the future and should either be fully (total resource rents) or partly deducted (user costs according to El Serafy method).

agricultural production, since this is already reflected (at least in principle) in lower personal consumption. In a similar fashion, the loss of natural habitat (specifically, wetlands) is a cumulative process. They calculate the value per acre of the flow of services from an acre of wetland.

Items of disservice in Eq. (5.3) are regarded as "implicit overestimates of welfare in the measure of personal consumption" (Cobb and Cobb 1994:51). The authors have deliberately omitted any estimate of the stock of human capital in the US ISEW. They do not want to quantify the qualitative nature of human capital. In their view, *quantitative* measures of the *costs* to knowledge and health dimensions are seen as key to the inquiry into sustainable economic welfare. Thus, the authors of the US ISEW do not think the measures of 'defensive educational and health expenditures' have anything to do with the formation or destruction of human capital (since it is excluded from their analysis).[171]

Both private and public education expenditures relate more to improving relative position in the labour market than to a significant overall increase in human capital or to increased productivity in the market. Overall, they argue that education becomes a "defensive expenditure necessary to protect one's 'market share'". An individual is much more compelled under a market-based system to obtain a college degree to gain access to certain jobs "simply because others have the degree". In addition, a certain proportion of private health and education expenditures are subtracted because they are included in *personal* consumption expenditures, and not subtracting them would involve double counting. Private ('*P*') and government ('*G*') health expenditures are subtracted because they are considered purely defensive in nature, i.e. compensating for growing health risks due to urbanisation.

In relation to the first basic template, there are several differences in methodology between US ISEW (1) and the revised measure, the US ISEW (2). The US ISEW (1) incorporates the disservices of national advertising (dšAd) and urbanisation (dš*P*Urban). The value of national advertising expenditures was deducted because national advertising (especially on TV and in magazines) tends to be aimed at creating demand for products and brand name loyalty by images that have little to do with the actual product. In addition, they account for the socioeconomic costs of urbanisation because of the increasing density and higher cost of living. In general, growing population density in urban areas (or overcrowding) implies that land and house prices and rents rise without a compensating increase in economic welfare. That is, as population grows in urban areas, the cost of land increased without any compensating increase in welfare.

[171] *N.B.* We discuss the conceptual problems of holding the stock of "human capital" constant in *Section 6.2, Chapter 6.*

However, subject to the criticisms in *The Green National Product* edited by Cobb and Cobb (1994), these two components were excluded. Advertising expenditures are seen as a 'business' item, not a *private* consumption expenditure item. On this basis, they were not deducted in the index. In relation to the item of urbanisation, there are many benefits from living in an urban area, yet the criticism raised was that the authors focused only on the negatives. The convenience of living nearby the greengrocers, cafes, pubs, churches, local parks, and the satisfaction received from owning a high-quality house (more likely in an urban area) are some examples of the positives. Without knowing exactly the effects of urbanisation on economic welfare, the authors omitted this item to be on the conservative side.

Out of suggestions from the same book, some further refinements to the original indicator were ratified. A minor innovation for US ISEW (2) is the additional ways that are possible to measure the distribution of income: harmonic mean, top quintile, low quintile, weighted ratio of shares and the Gini coefficient. Hence, multiple methods were utilised to adjust personal consumption expenditures by a distributional index of inequality. Another criticism relates to the net capital growth component, which includes all government structures and equipment (including military). But if only streets and roads among the government's expenditures on equipment and structures (GF_K) are considered to yield services that contribute to welfare, why are the full range of government equipment and structures considered necessary to equip the labour force and the excess counted as adding to welfare? Hence, for the US ISEW (2), only the stock of *private* physical and infrastructure capital ($\eta Inv_P F$) is incorporated.

Taking the total value of receipts from mineral production to account for ecological capital depletion attracted much criticism during the 1994 review of the US ISEW (1); a different valuation method was introduced, and this constitutes a minor advance. For the US ISEW (2), Cobb and Cobb (1994) estimate the amount of money that has to be put aside in order to compensate future generations for the loss of ecological capital. Consumption of primary *energy* fuels (coal, oil, gas, nuclear) is valued using a replacement cost factor, which reflects the costs involved in replacing each barrel of oil equivalent of energy consumed with renewable energy resources. The replacement cost was taken to be $75 in 1988 per barrel of oil equivalent (BOE) and is assumed to be subject to a 3% per year increase to account for the increasing costs of supplying each marginal unit of energy.[172] The replacement cost method is a different concept to the user cost method. Both assist in calculating the

[172] In any given year not only is the value of current resource consumption deducted but the values from all past years as well (see Cobb and Cobb 1994:74). Should the costs of climate change be *accumulated* over time? Atkinson (1995) and Neumayer (1999) argue that this way of evaluating long-term environmental damage is theoretically incorrect.

depreciation of the stock of ecological capital.[173] But the rationale behind the replacement cost method is to replace non-renewable resource use. The replacement costs are the amount of rent from resource production that should be reinvested in a process to create a perpetual stream of output of a renewable substitute (such as biofuels) for the non-renewable resource being depleted.

Furthermore, two new additions are evident in the US ISEW (2): 'ozone depletion' (δOzoneEK) and 'defensive expenditures on household (private) pollution abatement' (dš*P*PollĎ). Personal pollution control expenditures is only a *minor* improvement since Zolotas (1981) already made the effort to measure this item in his EAW. On the other hand, accounting for the depletion of the ozone in measuring the estimated costs of cumulative production of Chlorofluorocarbons (CFCs-11,12) represents a *major* innovation. This is an original contribution to the literature.

Illustrating the differences between the first and second US ISEWs will involve using a Venn diagram (discussed below). In order to keep the diagrams uncomplicated, the same format as before will be used, i.e. only the selected variables of importance are highlighted. But a few new conventions are employed, which are pertinent to this and other studies in *Sections 5.3–5.6*.

Firstly, the 'plus' and 'minus' items that comprise the indicator are divided into two sets. This makes the diagram uncluttered and clearer because each 'plus' and 'minus' set portrays the relevant extensions made to the 'benefit' and 'cost' items, respectively. The *union* of the two sets ('plus' and 'minus') contains all the items of the newer measure (e.g. the second US ISEW). The *intersection* of these two sets contains the same items as the template (e.g. the first US ISEW). For our purposes, any key modifications to the *existing* template items are specified (i.e. highlighted) in the intersection of the 'plus' and 'minus' sets.

Secondly, a dashed circle delineating element(s) in the universal set show the variables excluded from the original template. Authors exclude items from the existing template for various reasons, e.g. due to a lack of data or the irrelevance of certain items on smaller (subnational) spatial scales. In the technical assessment of *this chapter*, authors are not

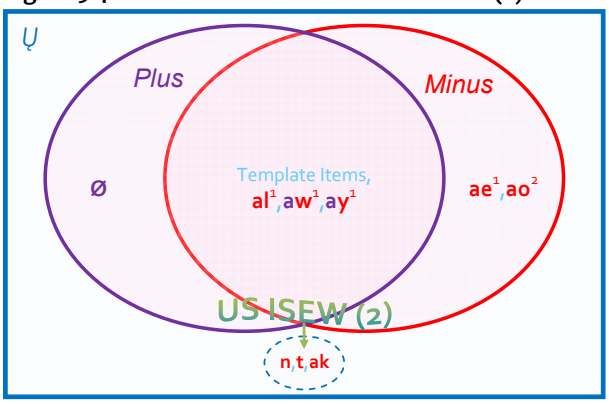
[173] The idea of the 'replacement cost method' is that non-renewable resource use, which cannot be prolonged forever and is therefore not sustainable into the indefinite future, would have to be replaced by renewable resources. It is methodologically correct to value it at the cost for replacing national consumption of non-renewable resources (not extraction). For an overview of the studies that utilised this method problematically, see Neumayer (2000). He argues that it might be more appropriate to assume that replacement costs are *falling* over time rather than rising over time, because costs fall over time as technology improves. The replacement cost method together with the 3% escalation factor has a substantial influence on the Dutch (1), Swedish, US and UK ISEWs (1, 2) and the US GPI (1). Neumayer then shows that the 'depletion of non-renewable resources' item no longer gives rise to a 'threshold hypothesis' when replacement costs are not assumed to escalate by 3% per annum (see Neumayer 2000:349-53).

penalised (or rewarded) for leaving out certain variables. Generally, this choice gives the benefit of doubt to the SEWI advocates.

Thirdly, a simple rating system is devised in order to work out the *technical advances* of a study over the template design *and* over the prevailing empirical material. This is imperative for the comparative literary analysis—in relation to hypothesis four (H4). With respect to each variable assessed, the superscript number, 1 *or* 2, signifies either a 'minor' *or* 'major' a technical contribution. Major technical contributions (^{2}) are credited to the author(s) who *first* introduced a new variable and/or made a significant change in methods. Minor technical contributions (^{1}) are credited to the author(s) who subsequently copy these "new" variables and/or methods and apply them to their country/area of interest. That is, since nothing original from an evolutionary point of view has been created, it still represents a minor technical advance *with respect to* the basic template. It is necessary to assign some (minor) score since the 'basic template' is our point of reference, and it ensures that we are being on the conservative side of the SEWI cause. A 'major technical contribution' is a rough proxy for an innovation whereas a 'minor technical contribution' is not.

The following, one major innovation and four other minor improvements of the US ISEW (2) vis-à-vis the US ISEW (1) template are shown below in *Figure 5.4* below:

Figure 5.4. Technical Advances of the US ISEW (2) over the US ISEW (1)



KEY:
Ụ = Universal Set

Template US ISEW (1) = Plus ∩ Minus

US ISEW (2) = Plus ∪ Minus

Degree of technical contribution:
^{1} = minor, ^{2} = major

Omissions = *US ISEW (2)*^{C}

The dashed circle delineating element(s) in *Ụ* illustrates excluded variables from the original template

Key modifications to the existing *Template Items* = {al,aw,ay}
- al = {δEnerE$_K$ | Depletion of energy resources}
- aw = {ŋInv*PF*$_K$ | Net investment of durable fixed (private) capital}
- ay = {DI | Distribution index (adjustment)}

Excluded items from the basic template = *US ISEW (2)*^{C} = {n,t,ak}
- n = {dš*P*Urban | Disservices of the disamenities of urbanization (private level)}
- t = {dšAd | Disservices of advertising}
- ak = {δMineE$_K$ | Depletion of mineral resources}

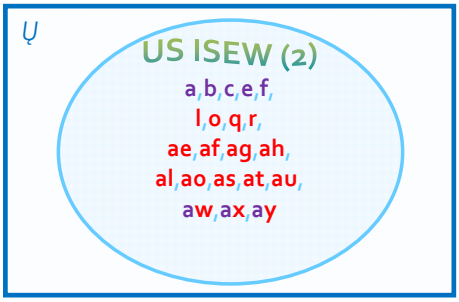
Extension of the benefit items = *Plus* \ *Minus* = {Ø}

Extension of the cost items = *Minus* \ *Plus* = {ae,ao}
- ae = {dš*P*PollĎ | Disservices of defensive expenditures on household pollution abatement}
- ao = {δOzoneE$_K$ | Depletion of the ozone}

US ISEW (2) is the union of the *Plus* and *Minus* sets. The basic template is the intersection of the *Plus* and *Minus* sets, *Template US ISEW (1)*. All twenty-two items of US ISEW (1) are in the *Plus* ∩ *Minus* area. Key modifications to the existing template items are vividly coloured in this area. This means that all other (non-coloured) items, referred to as "Template Items", have not changed significantly since the basic template. In *Figure 5.4*, the key modifications are the elements which we discussed above, al (δEnerEK, 'depletion of energy resources'), aw (ŋInv*P*FK, 'net investment of durable fixed (private) capital'), and ay (DI, 'distribution index (adjustment)')—'al', 'aw' and 'ay' are minor advances. The excluded items from the basic template comprise the complement (^{c}) of the *Plus* ∪ *Minus* set, i.e. *US ISEW (2)*^{c}. In the above figure, the dashed circle delineating elements in the universal set, *Ụ*, illustrates the three excluded variables from the original template. Finally, there can be extensions of the benefit (*Plus* \ *Minus*) or cost items (*Minus* \ *Plus*).[174] In *Figure 5.4*, there are no new extensions of the benefit items, the set is empty; the symbol, Ø, illustrates this. But there are two extensions of the cost items: ae (dš*P*PollĎ, 'disservices of defensive expenditures on household pollution abatement') and ao (δOzoneEK, 'depletion of the ozone'), where the inclusion of the latter item is an innovation in the literature. In summary, there are five technical advances (4 minor, 1 major) in the US ISEW (2).

In this study (in *Section 5.3*), the US ISEW (2) becomes the primary template for a comparative analysis of other ISEWs. The twenty-one items of *US ISEW (2)* are shown in *Figure 5.5* below:

Figure 5.5. The US ISEW (2) – Primary Template ISEW



KEY:
Ụ = Universal Set
= {a,...az | all the benefit and cost variables}

Primary Template ISEW = *US ISEW (2)*

US ISEW (2) =
{a,...c,e,f,l,o,q,r,ae,...ah,al,ao,as,...au,aw,...ay}

a = {ŝ*P*CE | Services from personal consumption expenditures}
b = {ŝCD$_K$ | Services from the stock of consumer durables}
c = {ŝ*G*F$_K$ | Services from durable fixed public capital}
e = {ŝ*G*heedE | Services of non-defensive public expenditures in health and education}
f = {ŝHh$_t$ | Services of household labour}
l = {CDE | Consumer durable expenditures}
o = {dš*P*AuAccĎ | Disservices of auto accidents (private defensive expenditures)}
q = {dš*P*Cm$_t$ | Disservices of private commuting}

[174] In set theory the symbol, " \ ", is the "setminus command" (Wikipedia 2009). 'Extension of the benefit items' (*Plus* \ *Minus*) is the *Minus* set subtracted from the *Plus* set. 'Extension of the cost items' (*Minus* \ *Plus*) is the *Plus* set subtracted from the *Minus* set. Items in these crescent shaped areas are not included in the basic template. Items belonging to any of these sets are considered 'new' additions to the existing template.

r = {dš*P*heedĎ | Disservices of defensive expenditures on private health and education outlays}
ae = {dš*P*PollĎ | Disservices of defensive expenditures on household pollution abatement}
af = {dšNoiPoll | Disservices of noise pollution}
ag = {dšAirPoll | Disservices of air pollution}
ah = {dšWatPoll | Disservices of urban water pollution}
al = {δEnerE_K | Depletion of energy resources}
ao = {δOzoneE_K | Depletion of the ozone}
as = {δNatHabE_K | Loss of wetlands and farmlands}
at = {δLandE_K | Loss of agricultural land}
au = {δFuturE_K | Long-term (future) environmental damage}
aw = {ŋInv*P*F_K | Net investment of durable fixed (private) capital}
ax = {ŋInt | Net international position}
ay = {DI | Distribution index (adjustment)}

The identity of US ISEW (2) and an explanation of the components are revealed in Eq. (5.4) below:

$$\begin{aligned} \text{ISEW} = {} & \hat{\mathbf{s}}[P\text{CE/DI}*100 + \text{CD}_K + G\text{F}_K + G\text{heedE} + \text{Hh}_t] + \text{ŋInv}P\text{F}_K + \text{ŋInt} \\ & - \mathbf{dš}[\text{CDE} + P\text{AuAccĎ} + P\text{Cm}_t + P\text{heedĎ}] \\ & - \mathbf{dš}\text{Poll}[P\text{PollĎ} + \text{Noi} + \text{Air} + \text{Wat}] \\ & - \boldsymbol{\delta}\mathbf{E}_K[\text{Ener} + \text{Ozone} + \text{NatHab} + \text{Land} + \text{Futur}] \end{aligned} \tag{5.4}$$

Services (ŝ)

*P*CE/ID*100 = personal consumption expenditures divided by the index of distribution inequality (multiple methods)
CD_K = the net stock of consumer durables (annual flow of 22.5%)
GF_K = durable fixed public capital (7.5% of the net stock of federal, state and local highways and streets, excluding military)
*G*heedE = non-defensive public expenditures in health and post-secondary education (50% for both at the federal, state and local level)
Hh_t = household labour (constant wage rate)
ŋInv*P*F_K = net investment of durable fixed (private) capital ($\dot{\eta}PF_K = \Delta\acute{r}*\eta PF_K - \acute{r}\%\Delta\text{LaborForce}*\acute{r}\eta PF_{K(t-1)}$)
ŋInt = net international position

Disservices (dš)

CDE = consumer durable expenditures
*P*AuAccĎ = auto accidents (private defensive expenditures) (damage of vehicles)
PCm_t = private commuting (indirect cost)
*P*heedĎ = defensive expenditures on private health and education outlays (50% for both)
*P*PollĎ = defensive expenditures on household (private) pollution abatement
NoiPoll = noise pollution
AirPoll = air pollution of SO_2, NO_2, PM (damage to agricultural vegetation, materials damage, costs of cleaning soiled goods, acid rain damage to forests and aquatic ecosystems, urban disamenities such as the reduction in property values, and aesthetics due to loss of visibility and enjoyment in national parks and other scenic areas) (using emission levels)[175]
WatPoll = urban water pollution (damage from point source discharges such as sewage and industrial wastes, and damage due to siltation from erosion from farms, construction sites and roadways)

Depletion of Ecological Capital (δE_K)

Ener = energy resources (via replacement costs of energy as a proxy)
Ozone = ozone (cumulative production of Chlorofluorocarbons: CFCs-11,12)
NatHab = wetlands and farmlands (both via soil degradation)
Land = agricultural land
Futur = long-term (future) environmental damage (linked to energy use)

A couple of small measurement revisions are worth mentioning. For US

[175] The authors utilise ambient air quality data to construct a revised time-series for the cost of air pollution. In theory, they attempt to estimate the loss of services from the *stock* of air pollution. However, for water and noise pollution, they do not calculate an estimate for the loss of services from the change in stock of water and noise pollution because of practical/conceptual difficulties. Therefore, a certain proportion of the 'air pollution' item—that portion affecting the ecological sink capacity—could be placed under the 'depletion of ecological capital' account in Eq. (5.4).

ISEW (2), the annual flow of services derived from the stock of durable consumer goods estimated over their useful life span is 22.5%. In contrast, for each year in the US ISEW (1), the total net stock was multiplied by 10%. The authors of the US ISEW (2) determine that the services of durable fixed public capital are 7.5% of the net stock of federal, state and local highways and streets, excluding military. In US ISEW (1), the estimated service flow of the gross stock of durable fixed public capital was 5%. These revisions are not significant enough to be graded by our marking system because they do not relate to a major (or 'minor') modification to an existing variable. Thus, as is evident in Eq. (5.4), the US ISEW (2) is a relatively minor update to the original ISEW.

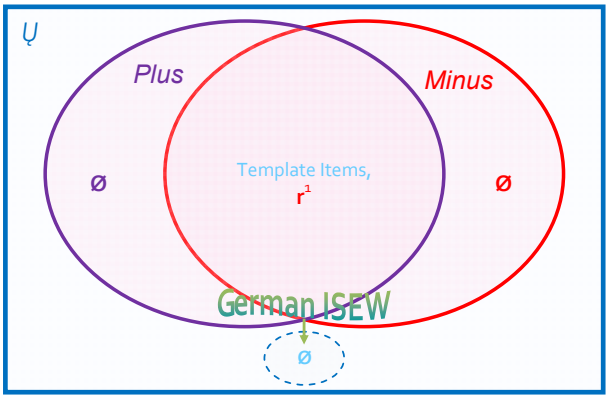
In conclusion, ISEW is the first measure of net welfare to include distribution, defensive costs, and sustainability (such as, the costs of long-term environmental damage) in the one index. With the exception of the German ISEW, which was created before the Second Edition of *For the Common Good*, the US ISEW (2) is central to our inquiry into the extent of basic template replication, as discussed in *Section 5.3* below:

5.3 Innovations Achieved over the Basic ISEW Template and the Prevailing Empirical Material

5.3.1 German ISEW – Diefenbacher (1994)

Only one minor technical contribution is evident in the German ISEW by Diefenbacher (1994) (as well as having no theory). At the time of the study, the social insurance system of the Federal Republic of Germany (FRG) is very different to the US system of education: attendance at public schools and universities is free in the FRG. Hence, the percentage of defensive expenditures in the area of advanced vocational training is very small and insignificant in the official statistics. There is no need to deduct defensive spending on *private* (non-public) education in the German ISEW. The technical advance of the German ISEW over the US ISEW (1) template is shown in *Figure 5.6* below:

Figure 5.6. Technical Advances of the German ISEW over the US ISEW (1) Template



KEY:
Ụ = Universal Set

Template US ISEW (1) = Plus ∩ Minus
German ISEW = Plus ∪ Minus

Degree of technical contribution:
¹ = minor, ² = major

Omissions = *German ISEW*^{C}

The dashed circle delineating element(s) in *Ụ* illustrates excluded variables from the original template

Key modifications to the existing *Template Items* = {r}
r = {dš*P*heĎ | Disservices of defensive expenditures on private health}
Excluded items from the basic template = *German ISEW*^{C} = {Ø}
Extension of the benefit items = *Plus* \ *Minus* = {Ø}
Extension of the cost items = *Minus* \ *Plus* = {Ø}

In *Figure 5.6* above, there is one key refinement to the existing template. There were no advances in the other categories.

The minute improvement in the German ISEW is reflected in Eq. (5.5) below:

$$\begin{aligned} \text{ISEW} = {} & \mathbf{\hat{s}}[\mathit{P}\text{CE}_{*}\text{DI} + \text{CD}_{K} + \mathit{G}\text{F}_{K} + \mathit{G}\text{heedE} + \text{Hh}_{t}] + \eta\text{Inv}\mathit{PBG}\text{F}_{K} + \eta\text{Int} \\ & - \mathbf{d\check{s}}[\text{CDE} + \mathit{P}\text{Urban} + \mathit{P}\text{AuAccĎ} + \mathit{P}\text{Cm}_{t} + \mathit{P}\text{heĎ} + \text{Ad}] \\ & - \mathbf{d\check{s}}\text{Poll}[\text{Noi} + \text{Air} + \text{Wat}] \\ & - \boldsymbol{\delta}\mathbf{E}_{\mathbf{K}}[\text{Mine} + \text{Ener} + \text{NatHab} + \text{Land} + \text{Futur}] \end{aligned} \qquad (5.5)$$

Services (ŝ)

*P*CE$_{*}$DI	=	personal consumption expenditures$_{*}$the index of distributional inequality (wage ratio)
CD$_K$	=	the stock of consumer durables (annual flow of 10%)
*G*F$_K$	=	durable fixed public capital (50% of the public expenditures on transport and communication)
*G*heedE	=	non-defensive public expenditures in health and post-secondary education (about 50% for both)
Hh$_t$	=	household labour (size of household production relative to GDP) (time-varying wage)
ηInv*PBG*F$_K$	=	net investment of durable fixed (private, business and government) capital (ηġ*PBG*F$_K$ = Δŕ$_{*}$η*PBG*F$_K$ –ŕ%ΔLaborForce$_{*}$ŕη*PBG*F$_{K(t-1)}$)
ηInt	=	net international position

Disservices (dš)

CDE	=	consumer durable expenditures
*P*Urban	=	the disamenities of urbanization (private level) (extra compensatory expenditures for building and for rental payments)
*P*AuAccĎ	=	auto accidents (private defensive expenditures) (damage of vehicles)
*P*Cm$_t$	=	private commuting (a share of the total traffic volume that is linked to the expenditures for passenger cars and public transport)
*P*heĎ	=	defensive expenditures on private health expenditures (the gross contributions to private health insurance funds plus 50% of the gross income of compulsory health insurance plans)
Ad	=	advertising (50% of advertising expenditures)
NoiPoll	=	noise pollution (e.g. diminutions of the value of housing and property due to street noise, noise abatement measures such as noise barriers and detuners, decreasing labour productivity due to noise problems at the workplace)
AirPoll	=	air pollution of NO_2, SO_2 CO, dust (health problems, and material and vegetation damage including "Waldsterben", the death of forests)
WatPoll	=	urban water pollution of rivers and lakes, sea, and ground-water

Depletion of Ecological Capital (δE_K)

Mine	=	mineral resources (total value of mining production each year)
Ener	=	energy (or fuel) resources (total value of mining production each year)
NatHab	=	wetlands (loss of soil and reduction of soil quality)
Land	=	agricultural land (loss of soil and reduction of soil quality)
Futur	=	long-term (future) environmental damage (ecological disruption from the consumption of fossil fuels and nuclear energy)

Regarding the above items in Eq. (5.5), a few points can be said. In Diefenbacher's work, the computations derived for many of the items in the German ISEW differ notably to Cobb's (1989) US ISEW, as the official statistics do not report such values. Interestingly, there are some differences in methodology since the issues only pertain to the FRG and

not the US. For instance, costs of urbanisation (dš*P*Urban) were assumed zero from 1950–1964 because the air-raids of World War II destroyed in some cities up to 80% of the housing, and there were extreme housing shortages in the 1950s. This made it impossible to compute an estimate of the disservices of urbanisation directly comparable to the US. In addition, for the index of distributional inequality, he uses wage income to total income as a proxy for income distribution rather than household income quintiles as in the US ISEW (1). The income inequality index is moving in an opposite direction to the ISEW. Hence, personal consumption expenditures (*P*CE) are multiplied by the wage ratio because the lower the wage ratio the less equal income is distributed. Generally, however, the German ISEW virtually replicates the itemised benefit/cost accounts of US ISEW (1).

5.3.2 UK ISEWs – Jackson and Marks (1994), Jackson *et al.* (1997)

Despite no overall theoretical framework, there are two major and two minor technical contributions of the UK ISEW (1) by Jackson and Marks (1994). Jackson and Marks (1994) criticise the US ISEWs (1, 2) for estimating the costs of air pollution in which Cobb (1989, 1994) utilised emissions of three priority pollutants (sulphur dioxide (SO_2), nitrogen oxides (NO_2) and particulates (PM)) in providing an index of air pollution. They argue that the choice of pollutants—emissions which all decreased over the period in question—was non-representative, and ignored the impact of certain other air emissions, such as volatile organic compounds (VOCs) and carbon monoxide (CO), which tended to increase. This means, in particular, that the benefits of reduced particulate emissions are (incorrectly) attributed to the total emissions index. A better way to account for the costs of each type of emission would be to account separately for the costs of each type of emission and then to sum these costs. Therefore, incorporating the environmental costs of a broader scope of emissions (SO_2, NO_2, PM, VOCs, CO) is a major development in the UK ISEW (1).

Jackson and Marks (1994) suggested that the ozone depletion item should account for the trend in *all* of the Montreal listed Chlorofluorocarbons, i.e. CFC-11, CFC-12, CFC-113, CFC-114 and CFC-115. Since production of CFCs 113, 114, and 115 was increasing even when production of CFCs 11 and 12 had begun to decline, they argue that by taking account of all five CFCs a more realistic picture of the changes over time would be obtained. Hence, the inclusion of the additional listed CFCs in the UK ISEW (1) is another major improvement.

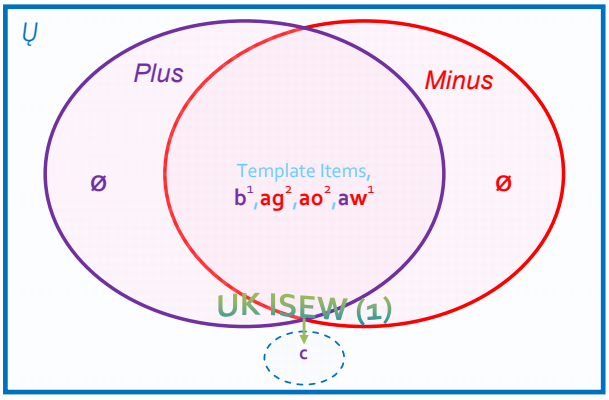
Cobb and Cobb (1994) only include net *private* capital growth. However, for UK ISEW (1), Jackson and Marks (1994) have essentially followed Cobb and Cobb's (1994) revised methodology, with the exception that they have included *public* sector corporations in the

accounts as well as net changes in the stock of private capital. This is because over the 1980s, the transfer of capital from public hands to private hands during a series of privatisations of public corporations (initiated by the former conservative governments) posed accounting problems. The inclusion of public capital is rated as a minor improvement.

The authors draw from a study that considers the services flowing from personal consumption expenditures *as a whole*. Yet it is essentially the same methodology for calculating the flow of services from durables as was used by Daly and Cobb (1989) and Cobb and Cobb (1994) in their ISEWs for the US. For the UK ISEWs, the service flow of consumer expenditure is divided into two main categories: consumables—where all service flows derive from expenditures in that year; and durables—wherein service flows derive from a number of years following the year of purchase, depending on the service life of the durable in question. Accordingly, the authors need only to calculate the difference between consumer durable expenditures and the services from the stock of consumer durables. They express the 'services flow' from consumer expenditures as a group, rather than from consumer durables *per se*. Nonetheless, different depreciation rates are applied to the three categories of durables. Consumer durables include cars, other durables and semi-durables. For durables other than cars, the applied depreciation rate is 15 percent, and for semi-durables, it is 30 percent. This is a minor advance, because the annual flow of the service value varies with eleven different categories of consumer durables, rather than valuing all durables with a standard depreciation rate.

The technical advances of the UK ISEW (1) over the US ISEW (2) template, including the abovementioned four contributions (2 minor, 2 major), are shown in *Figure 5.7* below:

Figure 5.7. Technical Advances of the UK ISEW (1) over the US ISEW (2) Template



KEY:
Ụ = Universal Set

Template US ISEW (2) = Plus ∩ Minus

UK ISEW (1) = Plus ∪ Minus

Degree of technical contribution:
[1] = minor, [2] = major

Omissions = *UK ISEW (1)*^{C}

The dashed circle delineating element(s) in *Ụ* illustrates excluded variables from the original template

Key modifications to the existing *Template Items* = {b,ag,ao,aw}
- b = {šCD$_K$ | Services from the stock of consumer durables}
- ag = {dšAirPoll | Disservices of air pollution}
- ao = {δOzoneE$_K$ | Depletion of the ozone}

aw = {ŋInvPGF_K | Net investment of durable fixed (private and government) capital}
Excluded items from the basic template = *UK ISEW (1)*^{C} = {c}
c = {ŝGF_K | Services from durable fixed public capital}
Extension of the benefit items = *Plus* \ *Minus* = {Ø}
Extension of the cost items = *Minus* \ *Plus* = {Ø}

The item, 'services from durable fixed public capital', is excluded because the service flows from public capital are already captured in their measure. With two major improvements, the UK ISEW (1) is a reasonably good contribution to the literature, albeit there were no new extensions or innovations to the US ISEW (2) template. Now, because of the similarities between the UK ISEW (1) and the UK ISEW (2), a single equation is formulated for both measures, as discussed below:

The following revisions are applied to UK ISEW (2): (a) use of the Atkinson index; (b) inclusion of natural habitats other than wetlands; (c) the use of a (discounted) marginal social cost to account for future long-term damage caused by climate change; and (d) a change in the basis for computing the costs of ozone depletion from domestic production to domestic consumption. The most significant revision relates to point (a), the income distribution inequality index. An intractable problem arises from the inherent assumption that one unit of consumption is much the same as another in terms of delivering welfare. However, Jackson *et al.* (1997) argue that one way to indicate relative changes in welfare is by utilising a welfare-theoretic adjustment to incomes based on measured inequalities in income distribution. The method is the so-called Atkinson index, which attempts to measure the equivalent equalised income associated with each unequal distribution of income. Historically, Gini coefficient is the focal measure for the adjustment of income distribution. But, according to the authors of the UK ISEW (2), the disadvantage of using the Gini coefficient is that it does not allow for an explicit assumption regarding society's aversion to income inequality. The Atkinson measure does.[176] The use of the Atkinson index is a major refinement to the existing template, since Jackson *et al.* (1997) are the first to implement this adjustment.

The original UK ISEW (1) included an assessment of costs associated with the loss of wetlands. However, Jackson *et al.* (1997) say that consideration of wetlands, as a principal category of land loss, is mainly

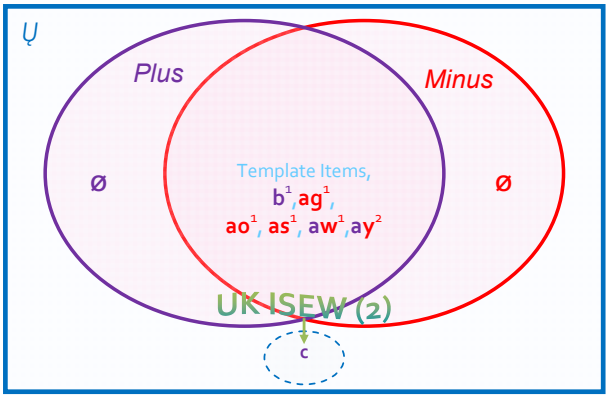
[176] The Atkinson (1970) index allows a parameter (ε) to represent society's aversion to inequality: Atkinson Index = 1 – $PCE[\sum_i (Y_i/Y)^{1/(1-\varepsilon)}.fi]^{1/(1-\varepsilon)}$. Where: Y_i is the income of all individuals in the i^{th} group (n groups altogether); fi is the proportion of the population with incomes in the i^{th} range; Y is the mean income; ε = 0 – infinity (If ε = 0, this implies no aversion to inequality) (If ε = infinity, implies extreme aversion to income inequality in the society). Since welfare falls as the inequality of income distribution increases, the Atkinson index must rise also. Hence, personal consumption expenditures item (*P*CE) in the ISEW is multiplied by 1 minus the income-based Atkinson index with the appropriate ε parameter. The best estimate from a UK empirical study is ε = 0.8. In principle, the value of ε can be determined in a given society by using attitudinal survey data on the level of well-being associated with different income levels (Jackson *et al.* 1997:9).

germane to North America. In Europe, most of the wetlands were lost a long time ago. But, a number of other kinds of land types have come increasingly under threat because of advancing urbanisation during the last half of the twentieth century. For example, uncultivated heathlands and moorlands have been declining steadily over the period in question. Jackson and Marks (1994) noted, therefore, that it would be more appropriate for a European ISEW to take a broader approach to the loss of natural habitat. Yet they did not include an adjustment in their estimate. Since the Scottish ISEW by Moffatt and Wilson (1994) has already used this alteration, it still counts as a 'minor contribution' to the UK ISEW (2).[177]

Rather than utilising Cobb's (1989, 1994) method of the 'long-term (future) environmental damage' item, this variable in the US ISEW (2) is directly linked to greenhouse gas emissions. They use a (discounted) marginal social cost to account for future long-term damage caused by climate change. There is no score given for this because it constitutes a small variation to the same variable. Also in the revised UK ISEW study, Jackson *et al.* (1997:25) have estimated the costs associated with ozone depletion based on the UK *consumption* of the Montreal-listed CFCs. This is because some countries (Sweden, for example) produce no CFCs at all, but by consuming them, they are clearly contributing to future environmental damage. This is a clever modification, but, Jackson and Stymne (1996) in their Swedish ISEW have already made this alteration; it counts as a minor contribution in the UK ISEW (2).

The technical advances of the UK ISEW (2) over the US ISEW (2) template are illustrated in *Figure 5.8* below:

Figure 5.8. Technical Advances of the UK ISEW (2) over the US ISEW (2) Template



KEY:
Ụ = Universal Set

Template US ISEW (2) = Plus ∩ Minus

UK ISEW (2) = Plus ∪ Minus

Degree of technical contribution:
¹ = minor, ² = major

Omissions = $UK\ ISEW\ (2)^C$

The dashed circle delineating element(s) in *Ụ* illustrates excluded variables from the original template

[177] As we stated at the beginning on page 273, to avoid the problem of being overly critical of the SEWI studies, in our rating system a lesser (minor) score is credited to the author(s) who integrated variables that are *not found in the basic template* and/or moderately changed the methods *found in the basic template*, applying them to their country/area of interest. Since nothing original has been created from the prevailing empirical material, a minor score is awarded here in the UK ISEW (2) because in this case the basic template, US ISEW (2), is the reference point of our investigation.

Key modifications to the existing *Template Items* = {b,ag,ao,as,aw,ay}
- b = {ŝCD_K | Services from the stock of consumer durables}
- ag = {dšAirPoll | Disservices of air pollution}
- ao = {δOzoneE_K | Depletion of the ozone}
- as = {δNatHabE_K | Loss of natural habitats/areas}
- aw = {ŋInv*PGF*$_K$ | Net investment of durable fixed (private and government) capital}
- ay = {DI | Distribution index (adjustment)}

Excluded items from the basic template = *UK ISEW (2)*^{C} = {c}
- c = {ŝ*GF*$_K$ | Services from durable fixed public capital}

Extension of the benefit items = *Plus* \ *Minus* = {Ø}
Extension of the cost items = *Minus* \ *Plus* = {Ø}

In summary, the authors of the UK ISEW (2) achieved five contributions (5 minor, 1 major) compared to the existing US ISEW (2) template. Combining the results of the UK ISEWs (1, 2), there are six technical contributions (3 minor, 3 major), albeit without any real conceptual support for the measures.

Identities of the UK ISEWs (1, 2) are shown in Eqs. (5.6), (5.7) below:

$$\begin{aligned} \text{ISEWs} = {} & \mathbf{\hat{s}}[\textit{P}\text{CE}_{*}(1\text{-ID}) + \text{CD}_K + \textit{G}\text{heedE} + \text{Hh}_t] + \text{ŋInv}\textit{PGF}_K + \text{ŋInt} \\ & - \mathbf{dš}[\text{CDE} + \textit{P}\text{AuAccĎ} + \textit{P}\text{Cm}_t + \textit{P}\text{heedĎ}] \\ & - \mathbf{dš}\text{Poll}[\textit{P}\text{Ď} + \text{Noi} + \text{Air} + \text{Wat}] \\ & - \boldsymbol{\delta E_K}[\text{Ener} + \text{Ozone} + \text{NatHab} + \text{Land} + \text{Futur}] \end{aligned} \qquad (5.6), (5.7)$$

Services (ŝ)

*P*CE$_*$(1-ID)	=	personal consumption expenditures divided by the index of distribution inequality (UK ISEW (1), *P*CE/ID$_*$100 via Gini) (UK ISEW (2), *P*CE$_*$(1-ID) via Atkinson index)
CD_K	=	the stock of consumer durables (varying the annual flow of the service value with eleven different categories of consumer durables)
*G*heedE	=	non-defensive public expenditures on health and further (higher) education (50% for both)
Hh_t	=	household labour (population$_*$shadow wage rate$_*$hours spend per year in productive labour at home) (excluding activities of domestic travel, gardening and shopping) (time-varying wage)[178]
ŋInv*PF*$_K$	=	net investment of durable fixed (private and government) capital (ŋġ*PGF*$_K$ = Δŕ$_*$ŋ*PGF*$_K$ – ŕ%ΔLaborForce$_*$ŕŋ*PGF*$_{K(t-1)}$)
ŋInt	=	net international position

Disservices (dš)

CDE	=	consumer durable expenditures
*P*AuAccĎ	=	auto accidents (private defensive expenditures on vehicle damage, excluding hospital and medical costs involved)
*P*Cm$_t$	=	private commuting (total expenditure on each mode of passenger transport$_*$the percentage of total mileage due to commuting)
*P*heedĎ	=	defensive expenditures on private health and education outlays (50%)
*P*PollĎ	=	defensive expenditures on household (private) pollution abatement
NoiPoll	=	noise pollution
AirPoll	=	air pollution of SO_2, NO_2, PM, VOCs, CO by marginal costs (environmental costs)
WatPoll	=	urban water pollution using an inland river water quality index (environmental costs)

Depletion of Ecological Capital (δE_K)

Ener	=	energy resources (via replacement costs of energy as a proxy)
Ozone	=	ozone (cumulative domestic production of CFCs-11,12,113,114,115, UK ISEW (1)) (cumulative domestic consumption of CFCs-11,12,113,114,115, UK ISEW (2))

[178] The shadow wage rate is the cost of employing a domestic worker in the commercial sector. For household labour, domestic travel was excluded because an increase in the time spent travelling (for instance to go shopping or taking children to school) seems, according to the authors, as not representing any clear increase in welfare. "In addition, many shopping activities are recreational in nature rather than "productive", and since we are excluding leisure from this account, they should also be excluded. Thus the final account for household labour included cooking and washing up, household repair and maintenance, and child care in the home" (Jackson *et al.* 1997:12).

NatHab = wetlands (UK ISEW (1)), natural habitats (UK ISEW (2))[179]
Land = agricultural land (productivity loss due to soil deterioration, urbanisation)
Futur = long-term (future) environmental damage (linked to energy use, UK ISEW (1)) (linked to greenhouse gas emissions, discounted marginal social costs, UK ISEW (2))

As can be seen above, despite the technical advances of the UK ISEWs (1, 2) made over the basic template, Eqs. (5.6), (5.7) are structurally similar to the US ISEW (2) template.

In a footnote, Jackson and Marks (1994:13) and Jackson *et al.* (1997:15) realise the significance of accounting for obsolescence in certain categories of durable goods, yet it is not undertaken in Eqs. (5.6), (5.7). In theory, separate accounting of expenditures on durables and the value of services received from the stock of durables *might* allow for changes in obsolescence of durable goods in the economy. For example, improvements in durability of goods would increase the service value associated with those goods without increasing personal consumption, whereas short-term obsolescence of durable goods tends to inflate consumer expenditure without adding to the service flowing from the stock. In practice, the task of computing the flow of services from a stock of durable is dependent on a complex set of information about lifetimes, opportunity costs, and depreciation charges as well as some means of evaluation of the service flowing.

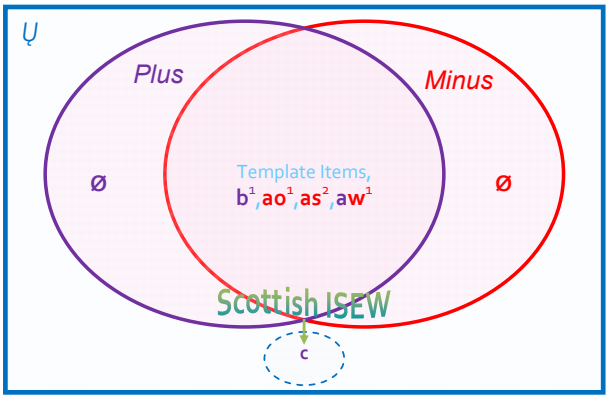
Lifetime and depreciation rates are taken as *constant* over the period of study—this implies that any potential reductions in the service value of consumer expenditures on durables because of increased technical, economic or fashion-driven obsolescence cannot be identified here. Yet when lifetimes are shorter, the depreciation rates are higher. But, "not all "premature" replacement of durable goods can be regarded as unwanted obsolescence, since some replacement arises from technological upgrading" (Jackson *et al.* 1997:15). It will be interesting to see how other authors deal with the problem of obsolescence in their measure.

5.3.3 Scottish ISEW – Moffatt and Wilson (1994)

Drawing closely on the methods of the UK ISEW (1), Moffatt and Wilson (1994) construct an ISEW for Scotland, albeit also without a theory. But, the authors of the Scottish ISEW do make a good advance in relation to the 'loss of natural habitats/areas' item (δNatHabE$_K$). They incorporate the loss of heathland, moorland and peatland areas. This is a major contribution because of the broader scope to the ecological problem of habitat destruction. This advance as well as some others of the Scottish ISEW over the US ISEW (2) template is shown in *Figure 5.9* below:

[179] In the revised UK ISEW (2), a time series for the costs of the loss of habitat has been constructed by computing the cumulative loss since 1930 for each year of the study, and then multiplying this by the cost estimate of 2,000 pounds per hectare (Jackson *et al.* 1997:21).

Figure 5.9. Technical Advances of the Scottish ISEW over the US ISEW (2) Template



KEY:
Ụ = Universal Set

Template US ISEW (2) = *Plus* ∩ *Minus*

Scottish ISEW = *Plus* ∪ *Minus*

Degree of technical contribution:
¹ = minor, ² = major

Omissions = *Scottish ISEW*^{C}

The dashed circle delineating element(s) in *Ụ* illustrates excluded variables from the original template

Key modifications to the existing *Template Items* = {b,ao,as,aw}
- b = {ŝCD$_K$ | Services from the stock of consumer durables}
- ao = {δOzoneE$_K$ | Depletion of the ozone}
- as = {δNatHabE$_K$ | Loss of heathland, moorland and peatland areas}
- aw = {ŋInv*PGF*$_K$ | Net investment of durable fixed (private and government) capital}

Excluded items from the basic template = *Scottish ISEW*^{C} = {c}
- c = {ŝ*GF*$_K$ | Services from durable fixed public capital}

Extension of the benefit items = *Plus* \ *Minus* = {Ø}
Extension of the cost items = *Minus* \ *Plus* = {Ø}

The following three items are directly copied from the UK ISEW (1): the services from the stock of consumer durables (ŝCDK); depletion of the ozone (δOzoneEK); and the net investment of durable fixed (private and government) capital (ŋInv*PG*FK). These are minor contributions given that the improvements were already implemented (in the UK ISEW (1) study). In summary, the figure above shows that there were zero extensions to the benefit and cost items. But the authors had four modifications to the existing template and so this is where the contributions are made (3 minor, 1 major).

Hence, the advancements to the Scottish ISEW are imperceptible in its identity, as shown in Eq. (5.8) below:

$$\begin{aligned} ISEW = {} & \mathbf{\hat{s}}[PCE/DI_{*100} + CD_K + GheedE + Hh_t] + \eta Inv PGF_K + \eta Int \\ & - \mathbf{d\check{s}}[CDE + PAuAccD\check{} + PCm_t + PheedD\check{}] \\ & - \mathbf{d\check{s}}Poll[P\check{D} + Noi + Air + Wat] \\ & - \mathbf{\delta E_K}[Ener + Ozone + NatHab + Land + Futur] \end{aligned} \quad (5.8)$$

Services (ŝ)

PCE/ID_{*100} = personal consumption expenditures divided by the index of distribution inequality (Gini)
CD_K = the stock of consumer durables (varying the annual flow of the service value with eleven different categories of consumer durables)
*G*heedE = non-defensive public expenditures on health and higher education (50% for both)
Hh_t = household labour by a time-varying wage (population*shadow wage rate*hours spend per year in productive labour at home) (excluding the activities of domestic travel, gardening and shopping)
ŋInv*PGF*$_K$ = net investment of durable fixed (private and government) capital ($\eta\dot{g}PGF_K = \Delta\acute{r}_{*}\eta PGF_K - \acute{r}\%\Delta LaborForce_{*}\acute{r}\eta PGF_{K(t-1)}$)
ŋInt = net international position

Disservices (dš)

CDE	=	consumer durable expenditures
PAuAccĎ	=	auto accidents (private defensive expenditures on vehicle accidents not involving injuries)
*P*Cm$_t$	=	private commuting (weekly expenditure on each mode of passenger transport*the proportion of miles attributable to commuting)
*P*heedĎ	=	defensive expenditures on private health and education outlays (50% for both)
*P*PollĎ	=	defensive expenditures on household (private) pollution abatement
NoiPoll	=	noise pollution
AirPoll	=	air pollution of SO_2, NO_x, PM, VOCs, CO by marginal costs (environmental costs)
WatPoll	=	urban water pollution derived from an index of river, canal and estuary water quality
		Depletion of Ecological Capital (δE_K)
Ener	=	energy resources (via replacement costs of energy as a proxy)
Ozone	=	ozone (cumulative domestic production of CFCs-11,12,113,114,115)
NatHab	=	heathland, moorland and peatland areas (due to urbanisation)
Land	=	agricultural land (productivity loss due to soil deterioration, urbanisation)
Futur	=	long-term (future) environmental damage (linked to energy use)

Overall, the Scottish ISEW in Eq. (5.8) is a minor contribution to the literature and highly replicates the US ISEW (2).

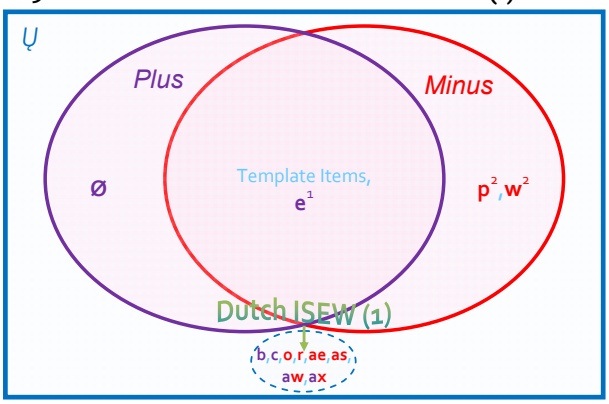
5.3.4 Dutch ISEW (1) – Rosenberg *et al.* (1995)

The assumption by Daly and Cobb (1989) that the public services of education are mostly defensive in nature does not seem to be appropriate for the Netherlands, as stated by Rosenberg *et al.* (1995). The authors of the Dutch ISEW (1) argue that public expenditures are much more important in Western Europe than in the US. Hence, their minor contribution is treating 100 percent of public expenditures in education as *non-defensive*. Yet the welfare-enhancing public expenditures such as those on public housing, culture, and recreation are disregarded in their ISEW.

Despite having absolutely no theory, there are two major technical contributions in the Dutch ISEW (1). The first relates to the 'disservices of automobile accidents and human injuries' (dšAuAcc) item. This is an advance over the template because rather than simply assessing the *vehicular* damage element of accidents, the authors are valuing *human* costs of injuries and death. This is a more holistic accounting approach (*cf.* variable 'o' vs. 'p' in *Table 5.1*). The other major innovation is the accounting of the costs of unemployment (dšUe$_t$). Unemployment was derived from the absolute number of unemployed divided by total potential workforce ('workforce' in Dutch is known as 'beroepsbevolking'). They utilise the opportunity cost method. The opportunity cost of unemployment is the number of unemployed multiplied by average wage per month times 12 months, minus the amount distributed as unemployment compensation. Accounting for the disservice items of human injuries from automobile accidents and unemployment are new extensions to the prevailing template.

Technical advances of the Dutch ISEW (1) over the US ISEW (2) template are illustrated in *Figure 5.10* below:

Figure 5.10. Technical Advances of the Dutch ISEW (1) over the US ISEW (2) Template



KEY:
Ụ = Universal Set

Template US ISEW (2) = *Plus* ∩ *Minus*
Dutch ISEW (1)= *Plus* ∪ *Minus*

Degree of technical contribution:
[1] = minor, [2] = major

Omissions = *Dutch ISEW (1)*^{C}

The dashed circle delineating element(s) in *Ụ* illustrates excluded variables from the original template

Key modifications to the existing *Template Items* = {e}
e = {ŝ*G*edE | Services of non-defensive public expenditures in education}
Excluded items from the basic template = *Dutch ISEW (1)*^{C} = {b,c,o,r,ae,as,aw,ax}
b = {ŝCD$_K$ | Services from the stock of consumer durables}
c = {ŝ*G*F$_K$ | Services from durable fixed public capital}
o = {dš*P*AuAccĎ | Disservices of auto accidents (private defensive expenditures)}
r = {dš*P*heedĎ | Disservices of defensive expenditures on private health and education outlays}
ae = {dš*P*PollĎ | Disservices of defensive expenditures on household pollution abatement}
as = {δNatHabE$_K$ | Loss of natural habitats/areas}
aw = {ŋInv*P*F$_K$ | Net investment of durable fixed (private) capital}
ax = {ŋInt | Net international position}
Extension of the benefit items = *Plus* \ *Minus* = {Ø}
Extension of the cost items = *Minus* \ *Plus* = {p,w}
p = {dšAuAcc | Disservices of automobile accidents and human injuries}
w = {dšUe$_t$ | Disservices of unemployment}

Figure 5.10 shows the authors have excluded eight variables from the primary template (typically, due to lack of data). But there are three advances (1 minor, 2 major innovations).

The modified, excluded and new variables of the basic template in the Dutch ISEW (1) are reflected in Eq. (5.9) below:

$$\begin{aligned} \text{ISEW} = {} & \mathbf{\hat{s}}[\textit{P}\text{CE/DI}_{*}100 + \textit{G}\text{edE} + \text{Hh}_t] \\ & - \mathbf{d\check{s}}[\text{AuAcc} + \textit{P}\text{Cm}_t + \text{Ue}_t] \\ & - \mathbf{d\check{s}}\text{Poll}[\text{Noi} + \text{Air} + \text{Wat}] \\ & - \boldsymbol{\delta}\mathbf{E}_{\mathbf{K}}[\text{Ener} + \text{Ozone} + \text{Land} + \text{Futur}] \end{aligned} \qquad (5.9)$$

Services (ŝ)

*P*CE/DI$_{*}$100 = personal consumption expenditures divided by the index of distributional inequality (low quintile option of the harmonic mean method)
*G*edE = non-defensive public expenditures in education (100%)
Hh$_t$ = household labour using wage rate of lowest 10% of wage earners

Disservices (dš)

AuAcc = automobile accidents (traffic intensity, human injuries, and deaths)
*P*Cm$_t$ = private commuting (expenditures on automobiles and public transport)
Ue$_t$ = unemployment by opportunity cost method (difference between average wage rate and the amount paid out in unemployment compensation)
NoiPoll = noise pollution
AirPoll = air pollution of NO_x, SO_x, VOCs, CO, aerosols (stationary/mobile sources from fossil fuel burning)
WatPoll = urban water pollution (surface and drinking water)

Depletion of Ecological Capital (δE_K)

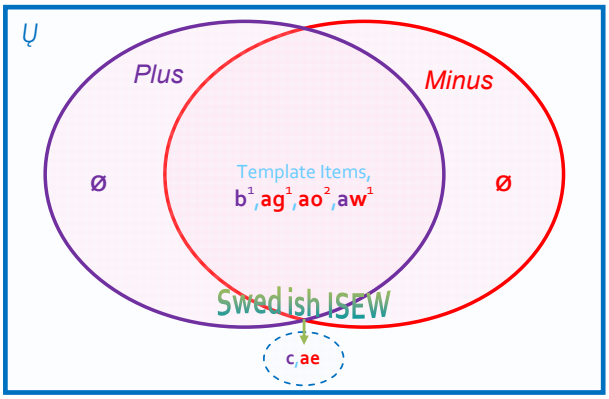
Ener	=	energy resources (via replacement costs of oil as a proxy)
Ozone	=	ozone (cumulative production of CFCs-11,12)
Land	=	agricultural land (non-built to built land uses)
Futur	=	long-term (future) environmental damage (via excess CO_2 role to climate change)

Overall, the Dutch ISEW (1) is only a modest advance over the US ISEW (2) template, but at least two major innovations were put forward.

5.3.5 Swedish ISEW – Jackson and Stymne (1996)

In their Swedish ISEW, Tim Jackson and Susanna Stymne (1996) make only four advances over the basic template, albeit there is one significant enhancement (yet without having an overall theory). They have used 'consumption' rather than production as the basis of cost estimation for ozone damage because Sweden is an 'importing' country (Jackson and Stymne 1996:32). In the other three cases, the advances have already been primed in earlier efforts—Scottish ISEW and the UK ISEW (1). The four technical advances of the Swedish ISEW over the US ISEW (2) template are shown in *Figure 5.11* below:

Figure 5.11. Technical Advances of the Swedish ISEW over the US ISEW (2) Template



KEY:
Ụ = Universal Set

Template US ISEW (2) = *Plus* ∩ *Minus*

Swedish ISEW= *Plus* ∪ *Minus*

Degree of technical contribution:
¹ = minor, ² = major

Omissions = *Swedish ISEW (1)*^{C}

The dashed circle delineating element(s) in *Ụ* illustrates excluded variables from the original template

Key modifications to the existing *Template Items* = {b,ag,ao,aw}
- b = {ŝCD_K | Services from the stock of consumer durables}
- ag = {dšAirPoll | Disservices of air pollution}
- ao = {δ$OzoneE_K$ | Depletion of the ozone}
- aw = {ŋInv*PBF*$_K$ | Net investment of durable fixed (private and business) capital}

Excluded items from the basic template = *Swedish ISEW*^{C} = {c,ae}
- c = {ŝ*GF*$_K$ | Services from durable fixed public capital}
- ae = {dš*P*PollĎ | Disservices of defensive expenditures on household pollution abatement}

Extension of the benefit items = *Plus* \ *Minus* = {Ø}
Extension of the cost items = *Minus* \ *Plus* = {Ø}

The four key items modified in *Figure 5.11* are ŝCDK, dšAirPoll, δOzoneEK, and ŋInv*PB*FK. There were no new extensions of the benefit or cost items. In brief, the authors of the Swedish ISEW made four contributions (3 minor, 1 major).

Because there are no major new extensions of the existing indicator

design, the Swedish ISEW does not alter the basic template, as shown in Eq. (5.10) below:

$$\begin{aligned} \text{ISEW} = {} & \mathbf{ŝ}[\textit{P}\text{CE/DI}_{*100} + \text{CD}_K + \textit{G}\text{heedE} + \text{Hh}_t] + \text{ŋInv}\textit{PB}\text{F}_K + \text{ŋInt} \\ & - \mathbf{dš}[\text{CDE} + \textit{P}\text{AuAccĎ} + \textit{P}\text{Cm}_t + \textit{P}\text{heedĎ}] \\ & - \mathbf{dš}\text{Poll}[\text{Noi} + \text{Air} + \text{Wat}] \\ & - \mathbf{\delta E_K}[\text{Ener} + \text{Ozone} + \text{NatHab} + \text{Land} + \text{Futur}] \end{aligned} \tag{5.10}$$

Services (ŝ)

$\textit{P}\text{CE/ID}_{*100}$	=	personal consumption expenditures divided by the index of distribution inequality (Gini)
CD_K	=	the stock of consumer durables (varying the annual flow of the service value with eleven different categories of consumer durables)
*G*heedE	=	non-defensive public expenditures on health and further (universities and adult) education (about 50% for both)
Hh_t	=	domestic household labour excluding "recreational" shopping, gardening, travelling to the shops, and caring for the elderly and sick relatives (time-varying shadow wage rate—equivalent to that of home help or hemsamarit)
$\text{ŋInv}\textit{PB}\text{F}_K$	=	net investment of durable fixed (private and business) capital ($\text{ŋġ}\textit{PB}\text{F}_K = \Delta\acute{r}_{*}\text{ŋ}\textit{PB}\text{F}_K - \acute{r}\%\Delta\text{LaborForce}_{*}\acute{r}\text{ŋ}\textit{PB}\text{F}_{K(t-1)}$)
ŋInt	=	net international position

Disservices (dš)

CDE	=	consumer durable expenditures
*P*AuAccĎ	=	auto accidents (private defensive expenditures on vehicle damage excluding hospital care, humane costs and production losses)
$\textit{P}\text{Cm}_t$	=	private commuting (the average cost per km*the number of commuting kilometres from cars and public transport)
*P*heedĎ	=	defensive expenditures on private health and education outlays (50%)
NoiPoll	=	noise pollution (urban expansion, traffic development, population density and preventive measures if higher than the safe level of 55dB—the *Swedish Environmental Protection Agency*)
AirPoll	=	air pollution of SO_2, NO_x, particulate (*stoft*), VOCs, CO (environmental costs)
WatPoll	=	urban water pollution using a river water quality index (environmental costs)

Depletion of Ecological Capital (δE_K)

Ener	=	energy resources (via replacement costs of energy as a proxy)
Ozone	=	ozone (cumulative domestic consumption of CFCs-11,12,113,114,115)
NatHab	=	wetlands (cumulative loss from the draining of forest land)
Land	=	agricultural land (productivity loss due to soil deterioration such as soil erosion and compaction, urbanisation)
Futur	=	long-term (future) environmental damage (linked to energy use)

Although the weakness of the Swedish ISEW is a lack of major technical advances, regarding Eq. (5.10) there are some areas of interest. For instance, defensive expenditures on *private* health and education outlays are relatively insignificant for Sweden because much of the expenditure on both health and education is borne by the government, i.e. the *public* sector (Jackson and Stymne 1996:21). In addition, they exclude health and production costs from their estimates of air and water pollution because of the issues of 'double counting'—on the basis that at least some account of this is taken in the treatment of health expenditures in the index.[180] Overall, except with one major improvement in technique in the existing template, the Swedish ISEW is a copy of the US ISEW (2) blueprint.

[180] The authors argue that it would have been better to use ambient air quality levels (flow level), rather than emissions levels for the category of air pollution.

5.3.6 Austrian ISEW – Stockhammer *et al.* (1997)

Stockhammer *et al.* (1997:22), authors of the Austrian ISEW, provide some good theory, showing that that the concept of ISEW involves three steps: (1) possible consumption base, (2) subtraction items (leading to a raw-ISEW), and (3) distribution. The possible consumption base (step 1) measures what could be consumed given the actual extent of production. The latter two items (steps 2, 3) make assertions about actual economic welfare, such as accounting for defensive (and potentially defensive) environmental and social expenditures. Defensive expenditures have *actually* occurred and are classed as not 'welfare-bearing' due to a systematic bias in the economic social system (e.g. needed to repair damages caused by the economic system itself). *Potential* defensive expenditures are the monetary costs that *would* have occurred *if* society had reacted to environmental devaluation in the same way (concerning one 'unit of pollution') as it reacts today (Stockhammer *et al.* 1997:23). In other words, they account for the costs incurred to society/ecology *even if* no actual market-based payments on protection goods have occurred, e.g. for the air and urban water pollution items.[181] Identifying potential defensive expenditures is a major innovation in the Austrian ISEW.

The authors aim for a 'new' level of consistency, which involves three specific requirements. *Requirement 1(RI)*: a clear distinction between stocks and flows. *Requirement 2(RII)*: only something counted positively in the first place can be subtracted afterwards. *Requirement 3(RIII)*: all subtraction items within one field should be methodically calculated in an analogous way. The authors argue that it is unreasonable to subtract full defensive costs from a weighted private consumption (*RII*). "Theoretically, each item should be weighted with an index indicating its specific distributional effects" (Stockhammer *et al.* 1997:25). As a rule, for the defensive social and environmental expenditures and the distribution of welfare, the authors work out the changes relative to the initial (base) year. Thus, for example, a more equal distribution contributes positively to economic welfare. When they exceed the level given by the base year, they are subtracted.[182]

The following adjustments are taken into account. Their raw-ISEW for Austria is divided by the index of distributional inequality in work and income. "Distribution is an integral part of welfare itself. As we generally reject methodological individualism, we regard welfare as a social phenomenon. It is only possible to speak of social welfare if society as a whole can take part in this welfare" (Stockhammer *et al.* 1997:30).[183] By rejecting methodological individualism, the whole (society) is more than

[181] Potential defensive expenditures were examined in *Section 4.4.7, Chapter 4.*

[182] "The comparison to the initial year does not necessarily imply that the value of that year was sustainable, but that a further increase in the amount of that item is not contributing to economic welfare" (Stockhammer *et al.* 1997:27).

[183] The individual and society are inextricably linked, as argued by John B. Davis (2003).

the sum of its parts (individuals).[184] To some degree, this can be seen in their index. They consider the distribution of income *and* work: the distribution of goods representing the material substance of economic welfare *and* the distribution of the effort necessary to produce these goods. Only changes in the distribution relative to the initial year are considered. This avoids judgements on the optimal distribution of income and work. Thus, the assumption implied is that a more equal distribution contributes positively to economic welfare. Adjusting income and work distribution to the raw-ISEW is a major innovation by Stockhammer *et al.* (1997).

The authors regard welfare as a social phenomenon. Thus, community, automobile accidents, urbanisation and health defensive expenditures are no longer a 'private' or individual phenomenon they are *social* aspects.[185] For instance, the individual no longer has a choice about whether to commute or not, for she or he cannot change the surrounding conditions. Their inclusions of *social* costs are significant. Yet the social defensive expenditures on auto accidents, commuting and health outlays are just minor refinements to the basic template because the techniques are no different to US ISEW (2). *All* of 'public consumption' is included in their Austrian ISEW. They argue that it is only possible to speak of social welfare if society as a whole can take part in this welfare. There is no *a priori* reason why public consumption (i.e. mostly services offered by the state) should be more or less welfare-bearing than private consumption. 100 percent of public expenditures are considered non-defensive. This is a major advance, as Daly and Cobb (1989, 1994) did not add public consumption premised on *social* welfare.

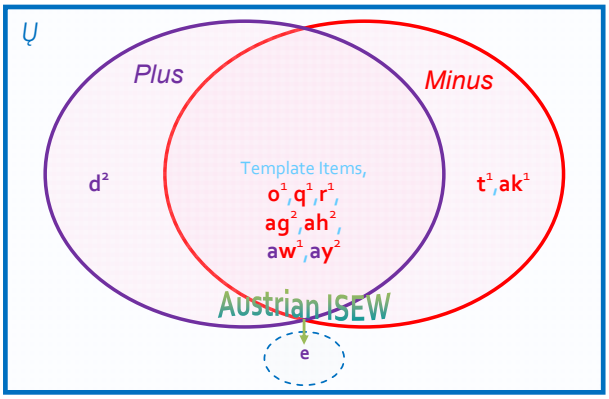
To be consistent with *RI*, net capital growth is multiplied by capital productivity since the item's aim is to indicate future consumption, not growth in assets, as: ŋġ*P*F$_K$∗λ*P*F$_K$ = Δŕ∗ŋ*P*F$_K$– ŕ%ΔLaborForce∗ŕŋ*P*F$_{K(t-1)}$. In other words, this variable is converted from the stock concept into a 'flow'. The net capital growth item in the Austrian ISEW is slightly modified, hence a minor improvement. Lastly, a proportion of advertising expenditure and depletion of minerals were deemed appropriate 'subtraction items'. These are minor advances for the reason that they were chosen by Zolotas (1981) and Cobb (1989) beforehand, albeit they are, of course, extensions to the basic template of Cobb (1994).

The technical advances of the Austrian ISEW over the US ISEW (2) are illustrated in *Figure 5.12* below:

[184] But whether the composite monetary indicator can assimilate such a theoretical position is another matter, discussed in *Chapter 6*.

[185] The authors realise the theoretical validity of counting the disamenities of urbanisation, yet it was not considered in the Austrian case study due to lack of data (see Stockhammer *et al.* 1997:28).

Figure 5.12. Technical Advances of the Austrian ISEW over the US ISEW (2)



KEY:
Ụ = Universal Set

Template US ISEW (2) = *Plus* ∩ *Minus*

Austrian ISEW = *Plus* ∪ *Minus*

Degree of technical contribution:
¹ = minor, ² = major

Omissions = *Austrian ISEW*^{C}

The dashed circle delineating element(s) in *Ụ* illustrates excluded variables from the original template

Key modifications to the existing *Template Items* = {n,o,q,r,ag,ah,aw,ay}
- o = {dšAuAccĎ | Disservices of auto accidents (social defensive expenditures)}
- q = {dšCm$_t$ | Disservices of commuting (social level)}
- r = {dšheĎ | Disservices of defensive expenditures on health outlays (social level)}
- ag = {dšAirPollĎ | Disservices of air pollution (potential defensive costs)}
- ah = {dšWatPollĎ | Disservices of urban water pollution (potential defensive costs)}
- aw = {ŋInv*PF*$_K$ | Net investment of durable fixed (private) capital}
- ay = {DI | Distribution index (adjustment)}

Excluded items from the basic template = *Austrian ISEW*^{C} = {e}
- e = {ŝ*G*heedE | Services of non-defensive public expenditures in health and education}

Extension of the benefit items = *Plus* \ *Minus* = {d}
- d = {ŝ*G*E | Services of non-defensive public expenditures}

Extension of the cost items = *Minus* \ *Plus* = {t,ak}
- t = {dšAd | Disservices of advertising}
- ak = {δMineE$_K$ | Depletion of mineral resources}

In *Figure 5.12* above, there are seven key modifications to the existing template. Non-defensive public expenditures in health and education (ŝ*G*heedE) were excluded; they were replaced by services of non-defensive public expenditures (ŝ*G*E). And, there are 'new' cost items, the disservices of advertising and accounting for the depletion of mineral resources. Overall, there are ten contributions (6 minor, 4 major).

Because there are seven modifications to the existing template, the structure of the Austrian ISEW does not drastically change, except that the cost/benefit items are adjusted by the distribution index, as shown in Eq. (5.11) below:

$$\begin{aligned} \text{ISEW} = {} & (\mathbf{\hat{s}}[PCE + CD_K + GF_K + GE + Hh_t] + \eta Inv PF_K + \eta Int \\ & - \mathbf{d\check{s}}[CDE + AuAcc\check{D} + Cm_t + he\check{D} + Ad] \\ & - \mathbf{d\check{s}}Poll[Noi + Air\check{D} + Wat\check{D}] \\ & - \mathbf{\delta E_K}[Mine + Ener + NatHab + Land + Futur])/DI_{*100} \end{aligned} \qquad (5.11)$$

Services (ŝ)

PCE	=	personal consumption expenditures
CD_K	=	the stock of consumer durables (20% annual flow)
GF_K	=	durable fixed public capital (10% depreciation rate of roads)
GE	=	non-defensive public expenditures (100%)
Hh_t	=	household labour (average wage rate of a janitor weighted to the hours worked)

ŋInvPF_K	=	net investment of durable fixed (private) capital, i.e. the increase in future consumption due to net capital growth (ŋġPF_K*λPF_K = Δŕ*ŋPF_K– ŕ%ΔLaborForce*ŕŋ$PF_{K(t-1)}$)[186]
ŋInt	=	net international position
		Disservices (dš)
CDE	=	consumer durable expenditures
AuAccĎ	=	auto accidents (social defensive expenditures) (damage of vehicles)
Cm_t	=	private commuting (social level) (expenditures)
heĎ	=	defensive expenditures on health outlays
Ad	=	advertising (50% of advertising spending)
NoiPoll	=	noise pollution (avoidance costs, utilising the number of people burdened strongly or very strongly by noise*the costs for noise protection windows (e.g. double-glazing))
AirPollĎ	=	air pollution (potential defensive costs according to the emissions of pollutants, thereby SO_2, NO_x, particles, VOCs, CO were weighted to the threshold levels of Austrian smog alarm plans)
WatPollĎ	=	urban water pollution (potential defensive costs utilising gross production values of main polluting sectors, the paper and chemical industries)
		Depletion of Ecological Capital (δE_K)
Mine	=	mineral resources (value added of the mining sector as a proxy)
Ener	=	energy resources (value added of the mining sector as a proxy)
NatHab	=	wetlands (price stemming from the political process used in negotiations between the land (local government) and the electricity company)
Land	=	agricultural land (unsustainable cultivation of soil, utilising the expenditures for fertilizers and herbicides as a proxy)
Futur	=	long-term (future) environmental damage (via excess CO_2 role to greenhouse effect)
		Distribution
DI*100	=	distribution index (adjustment) (the income differences between workers and employers, men and women, and average income and weighted by the share of the group concerned)

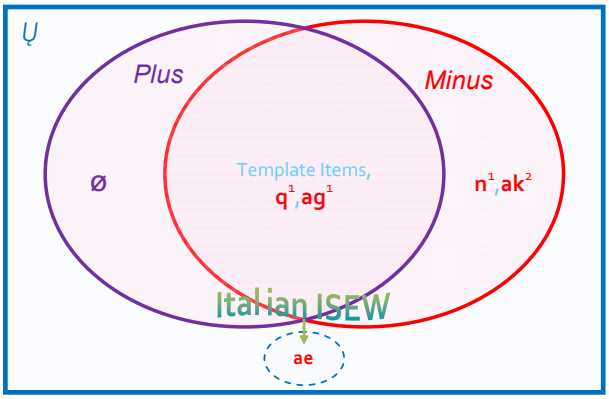
In the main, there are some very good technical refinements of the Austrian ISEW over the basic template, largely due to the superior conceptual foothold that Stockhammer *et al.* (1997) developed.

5.3.7 Italian ISEW – Guenno and Tiezzi (1998)

Guenno and Tiezzi (1998), authors of the Italian ISEW, make several improvements over the US ISEW (2), albeit there is no theoretical basis (they even allude to this on p. 11). For the private commuting item (*P*Cm*t*), they incorporate the maintenance *and* indirect costs of private/public transportation services. A few additional air pollutants (CO_2, TSP) are taken into consideration for the 'disservices of air pollution' item (dšAirPoll). And they subtract the disservices caused by the disamenities of urbanization (private level) (dš*P*Urban). These three items are only minor contributions. Nevertheless, when accounting for the depletion of mineral resources (δMineEK) the authors of the Italian ISEW achieve a significant advance. Manganese, magnesium, aluminium, copper, lead, zinc, sulphur, rock, pyrites, and rock salt are measured by user costs. So a more comprehensive account of the stock of mineral resources is a major innovation. The technical advances of the Italian ISEW over the US ISEW (2) are illustrated in *Figure 5.13* below:

[186] There is a slight inconsistency in their description of the net capital investment item. We assume that the "change in net capital stock" is equivalent to their meaning of "net capital growth" (see Stockhammer *et al.* 1997:24 v. 26).

Figure 5.13. Technical Advances of the Italian ISEW over the US ISEW (2) Template



KEY:
Ụ = Universal Set

Template US ISEW (2) = *Plus* ∩ *Minus*

Italian ISEW = *Plus* ∪ *Minus*

Degree of technical contribution:
¹ = minor, ² = major

Omissions = *Italian ISEW*^{C}

The dashed circle delineating element(s) in *Ụ* illustrates excluded variables from the original template

Key modifications to the existing *Template Items* = {q,ag}
q = {dš*P*Cm$_t$ | Disservices of private commuting}
ag = {dšAirPoll | Disservices of air pollution}
Excluded items from the basic template = *Italian ISEW*^{C} = {ae}
ae = {dš*P*PollĎ | Disservices of defensive expenditures on household pollution abatement}
Extension of the benefit items = *Plus* \ *Minus* = {Ø}
Extension of the cost items = *Minus* \ *Plus* = {n,ak}
n = {dš*P*Urban | Disservices of the disamenities of urbanization (private level)}
ak = {δMineE$_K$ | Depletion of mineral resources}

Figure 5.13 shows that there are two key modifications to the existing template and two 'new' extensions of the cost items. The 'dš*P*PollĎ' parameter, i.e. the defensive expenditures on household pollution abatement, is the only item omitted. Overall, there are four contributions (3 minor, 1 major).

The identity of the Italian ISEW is shown in Eq. (5.12) below:

$$\begin{aligned} ISEW = {} & \hat{\mathbf{s}}[PCE/DI_{*100} + CD_K + GF_K + GheedE + Hh_t] + \eta InvPF_K + \eta Int \\ & - \mathbf{dš}[CDE + PUrban + PAuAccĎ + PCm_t + PheedĎ] \\ & - \mathbf{dš}Poll[Noi + Air + Wat] \\ & - \boldsymbol{\delta E_K}[Mine + Ener + NatHab + Land + Futur] \end{aligned} \qquad (5.12)$$

Services (ŝ)

*P*CE/DI$_{*100}$	=	personal consumption expenditures divided by the income distribution index (arithmetic mean of three different indices of income inequality)
CD$_K$	=	the stock of consumer durables (10% annual flow and 34.9% of the stock invested in cars)
*G*F$_K$	=	durable fixed public capital (15% of gross stock of streets and highways)
*G*heedE	=	non-defensive public expenditures in health (50%) and education (100%)
Hh$_t$	=	household labour valued at opportunity cost (average unit salary per hour$_{*}$the number of hours spent on domestic labour per person per year$_{*}$the population under 14 in each year)
ηInv*P*F$_K$	=	net investment of durable fixed (private) capital
ηInt	=	net international position

Disservices (dš)

CDE	=	consumer durable expenditures
*P*Urban	=	the disamenities of urbanization (private level)
*P*AuAccĎ	=	auto accidents (private defensive expenditures) (damage of vehicles)
*P*Cm$_t$	=	private commuting (indirect and maintenance costs of private/public transportation services)
*P*heedĎ	=	defensive expenditures on private health and education outlays (50% for both)
NoiPoll	=	noise pollution utilising dose-response relationships (number of decibel to be abated according to the *WHO*$_{*}$unit abatement cost$_{*}$share of the total population subjected to noise pollution)
AirPoll	=	air pollution of SO_x, NO_x, CO_2, TSP linked to the ratio of emissions to energy consumption
WatPoll	=	urban water pollution linked to the unit cost vis-à-vis Biological Oxygen Demand (BOD_5)

abatement, indicating the quantity of oxygen necessary to eliminate organic and inorganic substance contained in one litre of water (restoration cost approach, i.e. expenditures necessary to clean polluted waters and to obtain an acceptable water quality)

Depletion of Ecological Capital (δE_K)

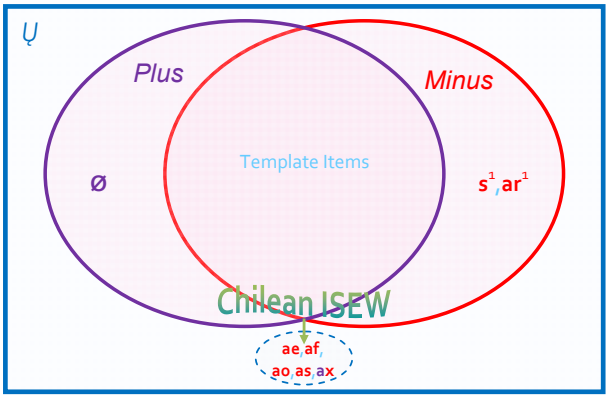
Mine	=	mineral resources (manganese, magnesium, aluminium, copper, lead, zinc, sulphur, rock, pyrites, rock salt) (via user cost)
Ener	=	energy resources (lignite, crude oil, methane, endogenous vapour) (via user cost)
NatHab	=	wetlands (cumulative costs per hectare lost)
Land	=	agricultural land (productivity loss due to soil erosion, urbanisation)
Futur	=	long-term (future) environmental damage (linked to energy use, such as wood, coal, natural gas, crude oil, nuclear and electric energy)

Overall, despite the good development of the minerals component, the authors of the Italian ISEW in Eq. (5.12) imitate the US ISEW (2) template liberally.

5.3.8 Chilean ISEW – Castañeda (1999)

Castañeda (1999), author of the Chilean ISEW, has no theory but nonetheless extends the basic template to include two 'new' variables: 1) criminal costs and 2) depletion of renewable resources. While these are fresh items over the template design, they were already considered in the US Genuine Progress Indicator (GPI) by Cobb *et al.* (1995). Therefore, to avoid double counting, both of these items in the Chilean study are counted as minor contributions. The author excluded five items. Four items were omitted because of lack of data: cost of noise pollution; loss of wetlands; cost of ozone depletion; and changes in net international position. The defensive expenditures on household pollution abatement were left out too. The author argues that this item has a small impact on the overall index and thus believes it should be excluded. The technical advances of the Chilean ISEW over the US ISEW (2) are shown in *Figure 5.14* below:

Figure 5.14. Technical Advances of the Chilean ISEW over the US ISEW (2)



KEY:
Ụ = Universal Set

Template US ISEW (2) = Plus ∩ Minus

Chilean ISEW = Plus ∪ Minus

Degree of technical contribution:
¹ = minor, ² = major

Omissions = *Chilean ISEW*^{C}

The dashed circle delineating element(s) in *Ụ* illustrates excluded variables from the original template

Key modifications to the existing *Template Items* = {Ø}
Excluded items from the basic template = *Chilean ISEW*^{C} = {ae,af,ao,as,ax}

ae = {dš*P*PollĎ | Disservices of defensive expenditures on household pollution abatement}
af = {dšNoiPoll | Disservices of noise pollution}
ao = {δOzoneE$_K$ | Depletion of the ozone}

as = {δNatHabE$_K$ | Loss of wetlands}
ax = {ŋInt | Net international position}
Extension of the benefit items = *Plus* \ *Minus* = {Ø}
Extension of the cost items = *Minus* \ *Plus* = {s,ar}
s = {dš*P*CrĎ | Disservices of defensive expenditures on crime prevention (private level)}
ar = {δForestE$_K$ | Loss of native forests}

In short, there are two innovations (2 minor, 0 major) in the Chilean ISEW, as shown above in *Figure 5.14*.

The identity of the Chilean ISEW incorporating the two 'new' variables, disservices of defensive expenditures on crime prevention (private level) (dš*P*CrĎ) and loss of native forests (δForestEK), is shown in Eq. (5.13) below:

$$\begin{aligned} \text{ISEW} = \; & \hat{\mathbf{s}}[\textit{P}\text{CE/DI}_{*100} + \text{CD}_K + \textit{G}\text{F}_K + \textit{G}\text{heedE} + \text{Hh}_t] + \eta\text{Inv}\textit{P}\text{F}_K \\ & - \mathbf{d\check{s}}[\text{CDE} + \textit{P}\text{AuAccĎ} + \textit{P}\text{Cm}_t + \textit{P}\text{heedĎ} + \textit{P}\text{CrĎ}] \\ & - \mathbf{d\check{s}}\text{Poll}[\text{Air} + \text{Wat}] \\ & - \boldsymbol{\delta}\mathbf{E}_K[\text{Ener} + \text{Forest} + \text{Land} + \text{Futur}] \end{aligned} \qquad (5.13)$$

Services (ŝ)

*P*CE/DI$_{*100}$	=	personal consumption expenditures divided by the index of distribution inequality (Gini)
CD$_K$	=	the stock of consumer durables (22.5% annual flow)
*G*F$_K$	=	durable fixed public capital (transportation and communication)
*G*heedE	=	non-defensive public expenditures in health and education (50% for both)
Hh$_t$	=	household labour (women's wages$_*$workforce dedicated to domestic labour)
ŋInv*P*F$_K$	=	net investment of durable fixed (private) capital

Disservices (dš)

CDE	=	consumer durable expenditures
*P*AuAccĎ	=	auto accidents (private defensive expenditures on vehicle damage)
*P*Cm$_t$	=	private commuting (expenditures on personal travel)
*P*heedĎ	=	defensive expenditures on private health and education outlays (50% for both)
*P*CrĎ	=	defensive expenditures on crime prevention (private level)
AirPoll	=	air pollution (health costs associated with increases in PM10)
WatPoll	=	urban water pollution (imputed cases of Typhus fever)

Depletion of Ecological Capital (δE$_K$)

Ener	=	energy resources
Forest	=	native forests (excluding erosion, loss of biodiversity, industrial pollution, and other long-term losses) (Hotelling rent)
Land	=	agricultural land (productivity loss due to soil erosion, urbanisation)
Futur	=	long-term (future) environmental damage (linked to energy use)

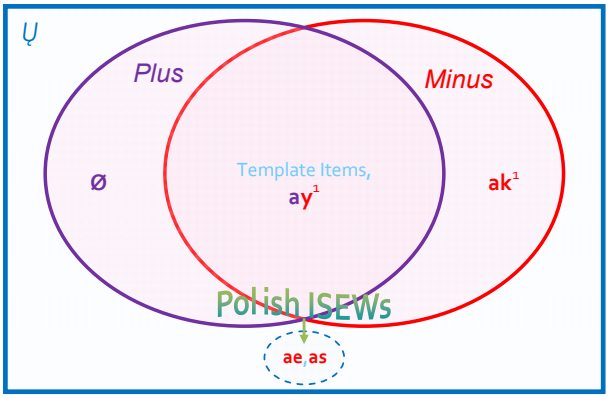
In Eq. (5.13), the methodology used to calculate the health costs for air pollution (associated with increases in PM10) and water pollution (imputed cases of Typhus fever) involves some likely double calculation for costs already deducted in private expenditures for healthcare. Yet, according to the author, this method still underestimates true cost, i.e. the damage to crops due to acid rain and corrosion is not included in the calculation. In general, the Chilean ISEW's technical contribution to the literature is insubstantial: the author replicates most of the items in the US ISEW (2) template and copies several variables from pre-existing GPI studies.

5.3.9 Polish ISEWs – Gil and Sleszynski (2003), Prochowicz and Sleszynski (2006)

There are two ISEWs calculated for Poland, the first by Gil and Sleszynski (2003), the second by Prochowicz and Sleszynski (2006). Even though the two studies concern different periods, both Polish ISEWs are considered together because the authors undertake identical adjustments. There are *some* elements of theory but the authors mainly borrow concepts from earlier analyses. Two minor advances are computed for their Polish ISEWs. In essence, they copy the adjustments made by Stockhammer *et al.* (1997) as discussed in *Section 5.3.6* above, albeit the analysis of *social* versus *individual* welfare is overlooked. They integrate a deduction of mineral resources and adjust the raw value by a distribution index. Also, a couple of items were excluded. The disservices of defensive expenditures on household pollution abatement do not contribute to the Polish ISEW value a great deal, so according to the authors this item is omitted. The loss of wetlands was excluded because it is not important in the Polish context.

The relatively negligible technical advances of the Polish ISEWs over the US ISEW (2) are shown in *Figure 5.15* below:

Figure 5.15. Technical Advances of the Polish ISEWs over the US ISEW (2)



KEY:
Ụ = Universal Set

Template US ISEW (2) = *Plus* ∩ *Minus*

Polish ISEWs = *Plus* ∪ *Minus*

Degree of technical contribution:
¹ = minor, ² = major

Omissions = *Polish ISEWs*^{C}

The dashed circle delineating element(s) in *Ụ* illustrates excluded variables from the original template

Key modifications to the existing *Template Items* = {ay}
ay = {DI | Distribution index (adjustment)}
Excluded items from the basic template = *Polish ISEWs*^{C} = {ae,as}
ae = {dš*P*PollĎ | Disservices of defensive expenditures on household pollution abatement}
as = {δNatHabE$_K$ | Loss of wetlands}
Extension of the benefit items = *Plus* \ *Minus* = {Ø}
Extension of the cost items = *Minus* \ *Plus* = {ak}
ak = {δMineE$_K$ | Depletion of mineral resources}

As portrayed in *Figure 5.15* above, the two minor contributions attributable to the Polish ISEWs are the 'δMineEK' and 'DI' variables.

The Polish ISEWs are thus marginally different to the stencil set out by Cobb (1994), even when the raw-ISEW is adjusted by the Gini distribution index, as shown in Eqs. (5.14), (5.15) below:

$$
\begin{aligned}
\text{ISEWs} = \; & \mathbf{\hat{s}(}[\mathit{P}\text{CE} + \text{CD}_K + \mathit{G}\text{F}_K + \mathit{G}\text{heedE} + \text{Hh}_t] + \eta\text{Inv}\mathit{P}\text{F}_K + \eta\text{Int} \\
& - \mathbf{d\check{s}}[\text{CDE} + \mathit{P}\text{AuAcc}\check{\text{D}} + \mathit{P}\text{Cm}_t + \mathit{P}\text{heed}\check{\text{D}}] \\
& - \mathbf{d\check{s}}\text{Poll}[\text{Noi} + \text{Air} + \text{Wat}] \\
& - \mathbf{\delta E_K}[\text{Mine} + \text{Ener} + \text{Ozone} + \text{Land} + \text{Futur}])/\text{DI}{*}100 \qquad (5.14),(5.15)
\end{aligned}
$$

Services (ŝ)

PCE	=	personal consumption expenditures
CD_K	=	the stock of consumer durables (20% annual flow)
$\mathit{G}F_K$	=	durable fixed public capital (investment in transport)
GheedE	=	non-defensive public expenditures in health and education (50% for both)
Hh_t	=	household labour
$\eta\text{Inv}\mathit{P}F_K$	=	net investment of durable fixed (private) capital
ηInt	=	net international position

Disservices (dš)

CDE	=	consumer durable expenditures (8.5% share of total expenditures)
PAuAccĎ	=	auto accidents (private defensive expenditures, registered costs of automobile accidents)
$\mathit{P}Cm_t$	=	private commuting (time lost)
PheedĎ	=	defensive expenditures on private health and education outlays (50% for both)
NoiPoll	=	noise pollution (public expenditures on protection against noise and vibration and imputed private expenditures)
AirPoll	=	air pollution
WatPoll	=	water pollution

Depletion of Ecological Capital (δE_K)

Mine	=	mineral resources (annual net value added of the mining sector as a proxy)
Ener	=	energy resources (annual net value added of the mining sector as a proxy)
Ozone	=	ozone (cumulative production of emitted Freons)
Land	=	agricultural land (farmland area converted into non-agricultural use and prices of the land)
Futur	=	long-term (future) environmental damage (cumulative costs of emissions of CO_2, using energy consumption as a proxy)

Distribution

DI*100	=	distribution index (adjustment) (Gini)

The conclusion is obvious: the Polish ISEWs are virtual replications of the basic US ISEW (2) template.

5.3.10 Thai ISEW – Clarke and Islam (2004, 2005a), Clarke (2006b)

The Thai ISEW is a fascinating and innovatory study. The authors provide good examples of the market and social choice perspectives vis-à-vis the various subsystems in Chapter 4 of *Economic Growth and Social Welfare* (see Clarke and Islam 2004). Thankfully, the authors go to a great length at trying to put forward a theoretical foundation for their ISEW, a 'social welfare function' ingrained in a systems analysis.[187] In the political subsystem, for example, corruption places wealth into the control of a limited number. Thus, even though a few individuals may benefit, at a social level, corruption misrepresents the market distribution of goods and services away from the poor in support of the powerful. In addition, paying off soaring levels of non-productive debt with public funds can lead to grave social accountability problems. For the 'spiritual' subsystem, because of exploitation, near slave conditions, violence and

[187] This theory is discussed in detail in *Chapter 3, Section 3.4* and then critiqued in *Section 3.5*.

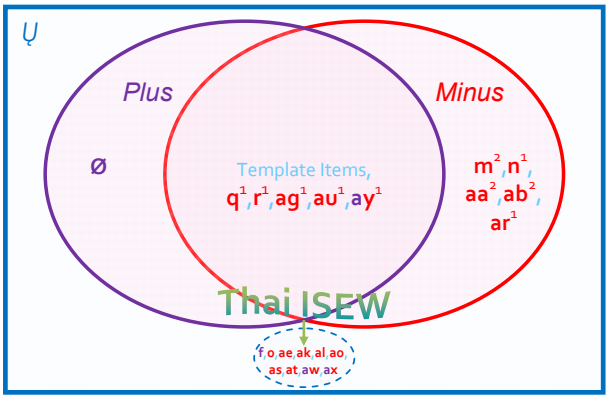
the involvement of children and other vulnerable people, the economic value of commercial sex work is subtracted from their ISEW. The proper social cost of commercial sex work is not directly captured within market preferences. However, the social costs of commercial sex work are real in terms of justice, poverty, and intergenerational equity. Accounting for the disservices of public corruption (dš*G*Cor), public debt (*G*DebtE), and commercial sex work (dš*B*SexW) are major contributions to the literature.

Social choice theory has implications for other items in the Thai ISEW. The authors interpret the disservices of the disamenities of urbanisation and commuting as socio-environmental problems (as distinct to merely considering the *private* costs). Yet, the social and environmental costs of urbanisation and commuting are just minor advances to the basic template because the techniques are no different to US ISEW (2). An important—albeit small improvement—is the inclusion of 75 percent of public expenditures in health and education as non-defensive. Only some of the additional public spending is for defensive purposes (25%), rather than assuming 50% of health and education expenditures as in the template. This ensures the higher importance of education in enhancing 'social or human capital' in developing countries, albeit this does not account for the change in the stock of human/social capitals *per se*. Seventy-five percent of medical expenditure was added as a benefit of economic growth because one of the major benefits is the increase in life expectancy within Thailand, which has increased ten years from 60 to 70 between 1975 and 1999 (Clarke and Islam 2005).

In the Thai study, counting deforestation and an Atkinson distribution index are not significant innovations because these have been previously included in other studies (e.g. the Australian GPI 1b and UK ISEW 2). Forest depletion and utilising a different inequality index are rated as minor contributions. The authors of the Thai ISEW have implemented a better way of dealing with two of the environmental items, long-term environmental damage (δFuturEK) and air pollution (dšAirPoll). In addition to costs associated with carbon emissions of fuel consumption, their 'δFuturEK' item includes the costs of lost CO_2 absorption from forests and increased methane emissions from wet rice farming. Their 'dšAirPoll' item integrates a wider range of emissions than the basic template, i.e. SO_x, NO_x, CO, CO_2 and SPM from major polluting sectors. These adjustments are thus minor refinements because they have been done before in some former studies.

The technical advances of the Thai ISEW over the US ISEW (2) are illustrated in *Figure 5.16* below:

Figure 5.16. Technical Advances of the Thai ISEW over the US ISEW (2)



KEY:
Ụ = Universal Set

Template US ISEW (2) = *Plus* ∩ *Minus*
Thai ISEW = *Plus* ∪ *Minus*

Degree of technical contribution:
¹ = minor, ² = major

Omissions = *Thai ISEW*^{C}

The dashed circle delineating element(s) in *Ụ* illustrates excluded variables from the original template

Key modifications to the existing *Template Items* = {q,r,ag,au,ay}
- q = {dšCm$_t$ | Disservices of commuting (social costs)}
- r = {dš*P*heedĎ | Disservices of defensive expenditures on private health and education outlays}
- ag = {dšAirPoll | Disservices of air pollution}
- au = {δFuturE$_K$ | Long-term (future) environmental damage}
- ay = {DI | Distribution index (adjustment)}

Excluded items from the basic template = *Thai ISEW*^{C} = {f,o,ae,ak,al,ao,as,at,aw,ax}
- f = {šHh$_t$ | Services of household labour}
- o = {dš*P*AuAccĎ | Disservices of auto accidents (private defensive expenditures)}
- ae = {dš*P*PollĎ | Disservices of defensive expenditures on household pollution abatement}
- ak = {δMineE$_K$ | Depletion of mineral resources}
- al = {δEnerE$_K$ | Depletion of energy resources}
- ao = {δOzoneE$_K$ | Depletion of the ozone}
- as = {δNatHabE$_K$ | Loss of natural habitats/areas}
- at = {δLandE$_K$ | Loss of agricultural land}
- aw = {ŋInv*PF*$_K$ | Net investment of durable fixed (private) capital}
- ax = {ŋInt | Net international position}

Extension of the benefit items = *Plus* \ *Minus* = {Ø}
Extension of the cost items = *Minus* \ *Plus* = {m,n,aa,ab,ar}
- m = {*G*DebtE | Public debt expenditures}
- n = {dšUrban | Disservices of the disamenities of urbanization}
- aa = {dš*B*SexW | Disservices of commercial sex work}
- ab = {dš*G*Cor | Disservices of public corruption}
- ar = {δForestE$_K$ | Loss of native forests}

Ten items of the original template have been excluded in the Thai ISEW, as shown in *Figure 5.16* above. There are absolutely *no* reasons specified by the authors for their omission. Nonetheless, ten contributions (7 minor, 3 major) are prevalent in the Thai ISEW.

The Thai ISEW is a relatively good advance over the US ISEW (2) template, especially with the development of new context-specific alterations (such as the costs of commercial sex work), as shown in Eq. (5.16) below:

$$\begin{aligned} \text{ISEW} = \; & \hat{\mathbf{s}}[\textit{P}\text{CE}_{*}(1\text{-DI}) + \text{CD}_K + \textit{G}\text{F}_K + \textit{G}\text{heedE}] \\ & - \mathbf{d\check{s}}[\text{CDE} + \textit{G}\text{DebtE} + \text{Urban} + \text{Cm}_t + \textit{P}\text{heĎ} + \textit{B}\text{SexW} + \textit{G}\text{Cor}] \\ & - \mathbf{d\check{s}}\text{Poll}[\text{Noi} + \text{Air} + \text{Wat}] \\ & - \boldsymbol{\delta}\mathbf{E}_K[\text{Forest} + \text{Futur}] \end{aligned} \qquad (5.16)$$

Services (ŝ)

*P*CE$_{*}$(1-DI) = personal consumption expenditures divided by the index of distribution inequality (Atkinson)

CD_K	=	the stock of consumer durables (10% annual flow)
GF_K	=	durable fixed public capital (50% of public spending on roads including building and maintaining)
*G*heedE	=	non-defensive public expenditures in health and education (75% for both)
		Disservices (dš)
CDE	=	consumer durable expenditures
*G*DebtE	=	public debt expenditures (50% of interest paid on non-productive debt, such as government consumption for subsidised fuel)
Urban	=	the disamenities of urbanisation (18% of Bangkok personal income is spent for access to clean water and air)
Cm_t	=	commuting (time lost for municipal populations in Bangkok)
*P*heĎ	=	defensive expenditures on private health outlays (50%)
*B*SexW	=	commercial sex work (3% of annual GNP)
*G*Cor	=	public corruption undertaken by bureaucrats including the military and police, and by politicians
NoiPoll	=	noise pollution (1% of GNP each year based on the *World Health Organisation*)
AirPoll	=	air pollution of SO_x, NO_x, CO, CO_2, suspended particulate matters (SPM) from five main polluting sectors, transportation, electricity, industry, household, and commercial sectors and others (pollution abatement)
WatPoll	=	urban water pollution vis-à-vis Biological Oxygen Demand (costs of cleaning water, i.e. restoring the quality of canal and river systems from food, drink, paper, chemical, and textile industries and from the municipal population)
		Depletion of Ecological Capital (δE_K)
Forest	=	native forests (cost of soil erosion*hectares of deforestation)
Futur	=	long-term (future) environmental damage (cost linked to loss of CO_2 absorption from forests, methane emissions from wet rice farming, and the carbon emissions from fuel consumption)

Overall, the authors of the Thai ISEW have made some vital contributions to the literature.

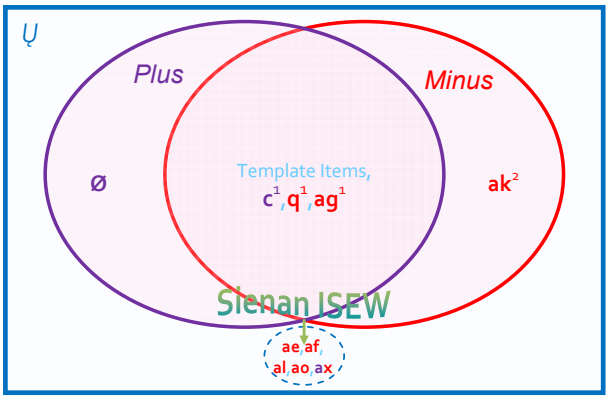
5.3.11 Sienan (Italy) ISEW – Pulselli *et al.* (2006)

Pulselli *et al.* (2006), authors of the Sienan ISEW, make a couple of small advances over the US ISEW (2), albeit without an overall theory. In a similar fashion to the Italian ISEW, they incorporate the maintenance *and* indirect costs of private/public transportation services for the private commuting item (*P*Cm_t). Likewise, a few additional air pollutants (CO_2, TSP) are taken into consideration for the 'disservices of air pollution' item (dšAirPoll). Specifically for the Sienan ISEW, the services of durable fixed public capital (*G*F_K) are applied to the context of a local urban environment. The sum of the value of services of the road system *and* the value of current public expenses in urban development, water distribution, and urban health are calculated. These three items are not substantial modifications (minor contributions) to the basic template.

However, when accounting for the depletion of mineral resources ($\delta MineE_K$) Pulselli *et al.* (2006) make good progress. They measure the depletion of the sand, clay, gravel, limestone, marble, travertine minerals by user costs. A detailed account of the stock of mineral resources of the local environs is a major innovation. More advances could have been achieved, but for various reasons it was not feasible. The authors had to omit the advertising and urbanisation cost items due to data problems. In the Province of Siena, noise pollution and ozone layer depletion are not substantial problems and thus also omitted.

The technical advances of the Sienan ISEW over the US ISEW (2) are illustrated in *Figure 5.17* below:

Figure 5.17. Technical Advances of the Sienan ISEW over the US ISEW (2) Template



KEY:
Ụ = Universal Set

Template US ISEW (2) = Plus ∩ Minus

Sienan ISEW = Plus ∪ Minus

Degree of technical contribution:
¹ = minor, ² = major

Omissions = *Sienan ISEW*^{C}

The dashed circle delineating element(s) in *Ụ* illustrates excluded variables from the original template

Key modifications to the existing *Template Items* = {c,q,ag}
- c = {š*G*F$_K$ | Services from durable fixed public capital}
- q = {dš*P*Cm$_t$ | Disservices of private commuting}
- ag = {dšAirPoll | Disservices of air pollution}

Excluded items from the basic template = *Sienan ISEW*^{C} = {ae,af,al,ao,ax}
- ae = {dš*P*PollĎ | Disservices of defensive expenditures on household pollution abatement}
- af = {dšNoiPoll | Disservices of noise pollution}
- al = {δEnerE$_K$ | Depletion of energy resources}
- ao = {δOzoneE$_K$ | Depletion of the ozone}
- ax = {ŋInt | Net international position}

Extension of the benefit items = *Plus* \ *Minus* = {Ø}
Extension of the cost items = *Minus* \ *Plus* = {ak}
- ak = {δMineE$_K$ | Depletion of mineral resources}

Figure 5.17 shows there are three key modifications to the existing template and one 'new' extension of the cost items. Five parameters were omitted. Overall, there are four contributions (3 minor, 1 major).

The identity of the Sienan ISEW is shown in Eq. (5.17) below:

$$\begin{aligned} \text{ISEW} = {} & \hat{\mathbf{s}}[P\text{CE}/(1{+}\text{DI}) + \text{CD}_K + GF_K + G\text{heedE} + \text{Hh}_t] + \eta\text{Inv}PF_K \\ & - \mathbf{d\check{s}}[\text{CDE} + P\text{AuAcc}\check{\text{D}} + P\text{Cm}_t + P\text{heed}\check{\text{D}}] \\ & - \mathbf{d\check{s}}\text{Poll}[\text{Air} + \text{Wat}] \\ & - \boldsymbol{\delta}\mathbf{E}_K[\text{Mine} - \text{NatHab} + \text{Land} + \text{Futur}] \end{aligned} \qquad (5.17)$$

Services (ŝ)

*P*CE/(1+DI) = personal consumption expenditures divided by the income distribution inequality index (Gini)
CD$_K$ = the stock of consumer durables (annual flow of services from houses, household appliances, personal computers, mobile phones, cars)
*G*F$_K$ = durable fixed public capital (sum of the value of services of the road system (equal to the cost of their maintenance) and the value of current public expenses in urban development, water distribution, and urban health)
*G*heedE = non-defensive public expenditures in health (50%) and education (100%)
Hh$_t$ = household labour valued at opportunity cost (average unit salary per hour of housewives, unemployed persons and students*the number of hours spent on domestic labour per person per year*the population under 14 in each year)
ŋInv*P*F$_K$ = net investment of durable fixed (private) capital

Disservices (dš)

CDE = consumer durable expenditures

*P*AuAccĎ	=	auto accidents (private defensive expenditures) (damage of vehicles)
*P*Cm$_t$	=	private commuting (indirect and maintenance costs of private/public transportation services)
*P*heedĎ	=	defensive expenditures on private health and education outlays (50% for both)
AirPoll	=	air pollution of SO_x, NO_x, CO_2, TSP (emission abatement)
WatPoll	=	urban water pollution (costs to purify the water supply based on a standard purification plant)
		Depletion of Ecological Capital (δE_K)
Mine	=	mineral resources (sand, clay, gravel, limestone, marble, travertine) (via user cost)
NatHab	=	wetlands (cumulative costs per hectare lost)
Land	=	agricultural land vis-à-vis a definitive loss of available bio-productive land due to the change in use (productivity loss due to soil erosion and urbanisation)
Futur	=	long-term (future) environmental damage (linked to energy use of petrol, diesel fuel, fuel oil, methane and electricity consumption)

In Eq. (5.17), the wetlands component, 'δNatHabE$_K$', appreciated in 1999; there was an increase in wetlands in the Province of Siena because local authorities had implemented a project to refill part of the Montepulciano Lake basin. Overall, despite the good development of the minerals component, the authors of the Sienan ISEW duplicate the US ISEW (2) template.

5.3.12 Yorkshire and Humber, Northern Way, UK ISEWs – Jackson *et al.* (2006)

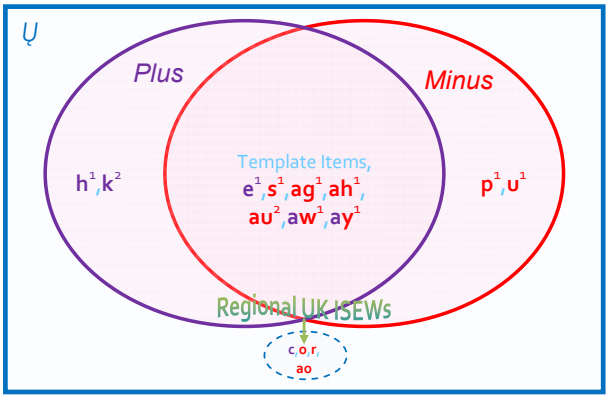
The regional (UK) ISEWs by Jackson *et al.* (2006) have made two major contributions, despite not having a theory. Long-term (future) environmental damage is calculated in an original way: by using a 'damage function' of CO_2, methane and NO_x emissions to plan annual payments into a climate change insurance/endowment fund. This ensures that enough money was available to cover the costs when they become due in 2050. More importantly, they attempt to work out the *net* effect of the global warming problem (from a localised perspective). They calculate the positive contributions from carbon sequestrations and the negatives of greenhouse gas emissions. Thus, it is assumed that an increase in the annual carbon sequestration (CO_2 equivalent saved) by various programmes results in a decrease of carbon in the atmosphere. Consideration of these issues is a major step forward over the existing ISEW template and over the prevailing empirical studies; it is a new variable.

Furthermore, nine minor advances are present in this study. The majority of them have simply been transposed from prior studies of the GPI, e.g. costs of family breakdown and automobile accidents (including human injuries), benefits of volunteer labour, Atkinson index adjustment, and net investment of durable fixed (business) capital. Their air and water pollution items are more inclusive than the basic indicator design. A variety of air pollutants are used: SO_x, NO_x, PM-10s, VOCs, CO, plus (at national level only), lead, benzene, 1,3-butadeine. For calculating the costs of urban water pollution by measuring 'potential defensive costs', environmental protection expenditures *and* cumulative costs of bringing

the river up to the target standard are used. Lastly, in the UK regional ISEWs of Yorkshire and Humber, and the Northern Way, all expenditure on health and tertiary education is considered a non-defensive benefit. In their model, defensive expenditures on health are subtracted elsewhere in the index, for instance by counting the health costs of crime, car accidents and atmospheric pollution.

Because they adapt various elements from earlier studies, the bulk of the technical advances of the regional UK ISEWs over the US ISEW (2) are minor improvements, as shown in *Figure 5.18* below:

Figure 5.18. Technical Advances of the Regional UK ISEWs over the US ISEW (2)



KEY:
Ụ = Universal Set

Template US ISEW (2) = *Plus* ∩ *Minus*

Regional UK ISEWs = *Plus* ∪ *Minus*

Degree of technical contribution:
¹ = minor, ² = major

Omissions = *Regional UK ISEWs*^{C}

The dashed circle delineating element(s) in *Ụ* illustrates excluded variables from the original template

Key modifications to the existing *Template Items* = {e,s,ag,ah,as,au,aw,ay}
- e = {šGheedE | Services of non-defensive public expenditures in health and education}
- s = {dšPBCrĎ | Disservices of defensive expenditures on crime prevention (private + business level)}
- ag = {dšAirPoll | Disservices of air pollution}
- ah = {dšWatPoll | Disservices of urban water pollution}
- au = {δFuturE$_K$ | Long-term (future) environmental damage}
- aw = {ŋInvBF$_K$ | Net investment of durable fixed (business) capital}
- ay = {DI | Distribution index (adjustment)}

Excluded items from the basic template = *Regional UK ISEWs*^{C} = {c,o,r,ao}
- c = {šGF$_K$ | Services from durable fixed public capital}
- o = {dšPAuAccĎ | Disservices of auto accidents (private defensive expenditures)}
- r = {dšPheedĎ | Disservices of defensive expenditures on private health and education outlays}
- ao = {δOzoneE$_K$ | Depletion of the ozone}

Extension of the benefit items = *Plus* \ *Minus* = {h,k}
- h = {šVol$_t$ | Services of volunteer labour}
- k = {šCSeq | Services of carbon sequestrations}

Extension of the cost items = *Minus* \ *Plus* = {p,u}
- p = {dšAuAcc | Disservices of automobile accidents and human injuries}
- u = {dšFamBr | Disservices of family breakdown}

In the figure above, four items were excluded; one of the omitted items is worthy of comment. Even though existing concentrations of CFCs continue to do harm, CFC emissions have almost completely ceased from developed countries (and thus immune from policy). Because of this, the authors exclude the costs of ozone depletion from their regional UK ISEWs. In total, there are eleven contributions (9 minor, 2 major) attributable to the study by Jackson *et al.* (2006).

The identity of the regional UK ISEWs is practically the same as the

basic template design of the GPI except for counting the benefits of carbon sequestrations (CSeq), as shown in Eq. (5.18) below:

$$\begin{aligned} \text{ISEWs} = {} & \mathbf{\hat{s}}[P\text{CE}_{*}(1\text{-DI}) + \text{CD}_{K} + G\text{heedE} + \text{Hh}_{t} + \text{Vol}_{t} + \text{CSeq}] + \eta\text{Inv}B\text{F}_{K} + \eta\text{Int} \\ & - \mathbf{d\check{s}}[\text{CDE} + \text{AuAcc} + P\text{Cm}_{t} + PB\text{Cr}\check{\text{D}} + \text{FamBr}] \\ & - \mathbf{d\check{s}}\text{Poll}[P\check{\text{D}} + \text{Noi} + \text{Air} + \text{Wat}] \\ & - \mathbf{\delta E_{K}}[\text{Ener} + \text{NatHab} + \text{Land} + \text{Futur}] \end{aligned} \qquad (5.18)$$

Services (ŝ)

$P\text{CE}_{*}(1\text{-DI})$	=	personal consumption expenditures divided by the index of distribution inequality (Atkinson)
CD_{K}	=	the stock of consumer durables
*G*heedE	=	non-defensive public expenditures in health and tertiary education (100% for both)
Hh_{t}	=	household labour (UK average wage for 'domestic staff and related occupations')
Vol_{t}	=	volunteer labour (UK average wage for 'domestic staff and related occupations')
CSeq	=	carbon sequestrations (CO_2 equivalent saved as a result of programmes)
$\eta\text{Inv}B\text{F}_{K}$	=	net investment of durable fixed (business) capital ($\eta\dot{g}B\text{F}_{K} = \Delta\acute{r}_{*}\eta B\text{F}_{K} - \acute{r}\%\Delta\text{LaborForce}_{*}\acute{r}\eta B\text{F}_{K(t-1)}$)
ηInt	=	net international position

Disservices (dš)

CDE	=	consumer durable expenditures
AuAcc	=	automobile accidents (damage to vehicles and property) and human injuries (killed or seriously injured, medical and ambulance costs but excluding police costs)
$P\text{Cm}_{t}$	=	private commuting (proportion of travel due to commuting via three main types of transport (private motor vehicle, bus/coach and rail/tube), and the proportion of relevant household expenditure including motor insurance in the private vehicle category as the cost)
*PB*CrĎ	=	defensive expenditures on crime prevention (private level) (health service costs, vehicle-related theft, and 50% of the average crime prevention expenditure per business*the number of VAT-registered businesses in the region)
FamBr	=	family breakdown (cost of divorce)
*P*PollĎ	=	defensive expenditures on household pollution abatement
NoiPoll	=	noise pollution (total vehicle kilometres as the proxy for traffic noise)
AirPoll	=	air pollution of SO_x, NO_x, PM-10s, VOCs, CO, plus lead, benzene, 1,3-butadeine for the UK ISEW (total emissions*cost per tonne for the selected pollutants)
WatPoll	=	urban water pollution (index of water pollution via river quality data) (environmental protection expenditures, such as the existing clean-up costs associated with the control of liquid discharges, and the cumulative cost of bringing 1km up to the target standard*the lengths of river)

Depletion of Ecological Capital (δE_K)

Ener	=	energy resources (via replacement costs of energy (oil) as a proxy)
NatHab	=	natural habitats/areas (WTP per hectare to preserve an area of wetlands—cumulative loss)
Land	=	agricultural land (soil erosion and loss of productivity due to intensive agriculture, loss of land actually given over to agriculture—cumulative loss)
Futur	=	long-term (future) environmental damage using a damage function of CO_2, methane and NO_x emissions to plan annual payments into a climate change insurance/endowment fund (ensures that enough money was available to cover the costs when they become due in 2050)

Obviously, the family breakdown item (FamBr) in Eq. (5.18) is limited to measuring the real impact of familial and social dislocation. Simply, the authors use the direct monetary costs of divorce. "But the true costs also include the emotional impact on divorcees and their families, greater pressure on housing stock and thus rising prices, "unnecessary" consumption (a married couple only need one kettle but a divorced couple need two), as well as the arguable and almost certainly unquantifiable effects on social cohesion in general" (Jackson *et al.* 2006:40). Only some aspects are covered by other components of the ISEW: for instance, lost output will be reflected in lower consumer expenditure. Estimating the cost of divorce is problematic, as it is

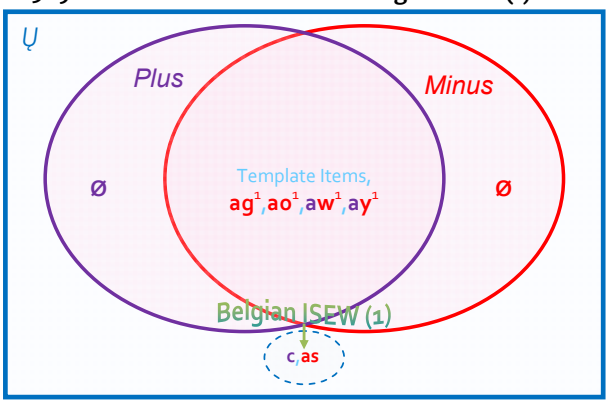
extremely multi-faceted. Nonetheless, the regional UK ISEWs by Jackson *et al.* (2006) are reasonably good contributions vis-à-vis technical aspects of net income indicators.

5.3.13 Belgian ISEWs – Bleys (2006a, 2006b); (2008)

Brent Bleys (2006a, 2006b, 2008) is the author of the ISEWs for Belgium who broadly follows Lawn's (2003) theory of 'net psychic income'. The 'traditional' Belgian ISEW (1) is discussed followed by the 'revised' Belgian ISEW (2). In the Bleys (2006a, 2006b) study, only four minor improvements to the Belgian ISEW (1) are made over the existing template design. When adjusting personal consumption expenditures divided by the index of distribution (DI), an Atkinson index is utilised as a replacement for the low-quintile index. For the 'net investment of durable fixed capital' item (ηInv*PG*Fᴋ), both private *and* government capital are included. A few additional air pollutants (CO, NVMOS) are taken into consideration for the 'disservices of air pollution' item (dšAirPoll). Similarly, a few supplementary ozone-depleting compounds (CFCs-113,114,115) in addition to CFCs-11,12 are taken into consideration for the 'δOzoneEᴋ' item. In short, the author has achieved four minor advances.

These four technical advances of the Belgian ISEW (1) over the US ISEW (2) template are shown in *Figure 5.19* below:

Figure 5.19. Technical Advances of the Belgian ISEW (1) over the US ISEW (2) Template



KEY:
Ụ = Universal Set

Template US ISEW (2) = Plus ∩ Minus
Belgian ISEW (1) = Plus ∪ Minus

Degree of technical contribution:
¹ = minor, ² = major

Omissions = *Belgian ISEW (1)*^{C}

The dashed circle delineating element(s) in *Ụ* illustrates excluded variables from the original template

Key modifications to the existing *Template Items* = {ag,ao,aw,ay}
- ag = {dšAirPoll | Disservices of air pollution}
- ao = {δOzoneE$_K$ | Depletion of the ozone}
- aw = {ηInv*PG*F$_K$ | Net investment of durable fixed (private and government) capital}
- ay = {DI | Distribution index (adjustment)}

Excluded items from the basic template = *Belgian ISEW (1)*^{C} = {c,as}
- c = {šGF$_K$ | Services of durable fixed public capital}
- as = {δNatHabE$_K$ | Loss of natural habitats/areas}

Extension of the benefit items = *Plus* \ *Minus* = {Ø}
Extension of the cost items = *Minus* \ *Plus* = {Ø}

Evident in the figure above, no extensions of the benefit or cost items

were prepared. Two items were excluded, '$\hat{s}GF_K$', the services of durable fixed public capital and 'δNatHabE$_K$', the loss of natural habitats/areas. Lack of good data prevented the measurement of the first item, and accounting for wetland loss was not applicable for Belgium. In general, there are four contributions (4 minor, 0 major).

Hence, the Belgian ISEW (1) is practically the same as the measure defined by Cobb (1994), as shown in Eq. (5.19) below:

$$\begin{aligned} ISEW = {} & \mathbf{\hat{s}}[PCE_{*}(1\text{-}DI) + CD_K + GheedE + Hh_t] + \eta InvPGF_K + \eta Int \\ & - \mathbf{d\check{s}}[CDE + PAuAccD\check{} + PCm_t + PheedD\check{}] \\ & - \mathbf{d\check{s}}Poll[PD\check{} + Noi + Air + Wat] \\ & - \mathbf{\delta E_K}[Ener + Ozone + Land + Futur] \end{aligned} \quad (5.19)$$

Services ($\hat{s}$)

$PCE_{*}(1\text{-}DI)$	=	personal consumption expenditures divided by the index of distribution inequality (Atkinson)
CD_K	=	the stock of consumer durables (annual flow of 12.5% from household appliances, private vehicles and durable recreational goods)
GheedE	=	non-defensive public expenditures in health (50%) and education (100%)
Hh_t	=	household labour (all time spent on homework, maintenance, shopping, purchase, use of services, childcare and transport) (average wage rate of domestic workers via historical (time-varying) shadow wage rates of cleaning personnel)
$\eta InvPGF_K$	=	net investment of durable fixed (private and government) capital ($\eta\dot{g}PGF_K = \Delta\acute{r}_{*}\eta PGF_K - \acute{r}\%\Delta LaborForce_{*}\acute{r}\eta PGF_{K(t-1)}$)
ηInt	=	net international position

Disservices ($d\check{s}$)

CDE	=	consumer durable expenditures
PAuAccD$\check{}$	=	auto accidents (private defensive expenditures) (property damage and insurance administration costs$_{*}$the number of accidents in each year)
PCm_t	=	private commuting
PheedD$\check{}$	=	defensive expenditures on private health (50%) and education (100%) outlays
PPollD$\check{}$	=	defensive expenditures on household pollution abatement in relation to the average cost to households of processing 1000 tons of waste (the purchase of garbage bags, taxes on household waste, rent or purchase of garbage containers and waste-related expenses of tenants)
NoiPoll	=	noise pollution (marginal costs of noise generated by road traffic)
AirPoll	=	air pollution of SO_2, NO_x, PM, CO, NVMOS using marginal social costs (control/damage costs)
WatPoll	=	urban water pollution (derived from a Belgian Biotic Index on the quality of surface water)

Depletion of Ecological Capital (δE_K)

Ener	=	energy resources (via replacement costs of energy as a proxy)
Ozone	=	ozone (cumulative consumption of CFCs-11,12,113,114,115)
Land	=	agricultural land via soil degradation (due to urban expansion, and poor land management such as erosion and compaction leading to productivity loss—a cumulative process)
Futur	=	long-term (future) environmental damage linked to greenhouse gas emissions (discounted marginal social costs)

There are no major advances to the existing template design in Eq. (5.19) above. As an isolated study, the Belgian ISEW (1) is a rather weak contribution to the literature considering that twelve years have passed since the US ISEW (2).

However, Bleys' (2008) intention was to compare and contrast the results of this "traditional" Belgian ISEW (1) with a "revised" one, the Belgian ISEW (2). The author has updated the valuation methods of four items. In terms of the relative degree of literature contribution, there are two minor and two major advances. Belgium is a country with a large

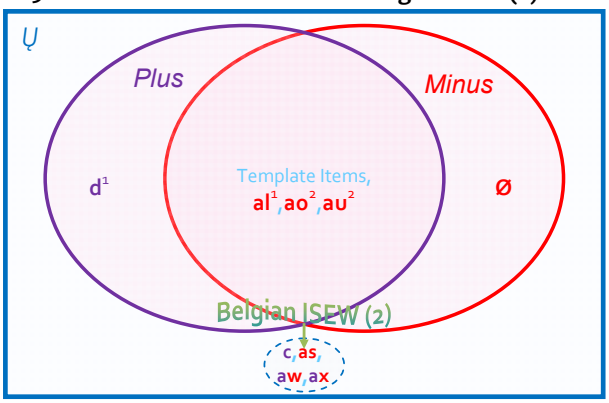
public sector. For that reason, the author allows for a more generous provision of the services of non-defensive public expenditures. The 'ŝGE' item now becomes a part of the Belgian ISEW (2) study. Even though this is an addition to the existing template, it is not an original contribution because this type of adjustment has been previously included in the Austrian ISEW by Stockhammer *et al.* (1997) and in the Australian GPI (1b) by Hamilton and Denniss (2000) (discussed later in *Section 5.4*). For the 'depletion of energy resources' item, the author has omitted the escalation factor, arguing that more research is needed in order to estimate the current and future costs of a large-scale transition towards a renewable energy system. This is not a fresh adjustment to the basic ISEW construction since Neumayer (2000) already tackled this issue in his critique. Hence, the methodological change to the 'δEnerEK' is also a minor advance.

The most important valuation changes relate to the 'δOzoneEK' and 'δFuturEK' items. He argues against Cobb and Cobb's (1994) method of *cumulating* the costs of ozone layer depletion and climate change. The US ISEW (2) uses the cumulation of emission *flows* to value the costs associated with these environmental issues. This can be a problematic assumption because these problems are caused by a *stock* of pollutants in the atmosphere (Bleys 2008:747). The correct interpretation is to account for the atmospheric lifetimes of these pollutants, since in the US ISEW (2) the costs of the related environmental problems are assumed *non-decreasing*. Yet the evidence suggests that the measures taken in the 1987 Montreal Protocol have effectively reduced emission of ozone depleting substances to almost zero (see Brennan 2004:262). He utilises data on historical emission rates of the different pollutants and estimates of the marginal social costs attributed to the stock of CFCs and CO_2. This revised methodology of tracking the depletion of ecological capital costs in the items of 'δOzoneEK' and 'δFuturEK' are major advances.

Also, two items within the methodology of the ISEW have been omitted: the 'net capital growth' item, ŋInv*B*FK, and the 'changes in the net international investment position' item, ŋInt. The author, who follows Lawn's interpretation of Fisher, considers that the annual changes in the stock of the 'net international investment position' are inappropriate because 'ŋInt' is a measure of capital (the stock of wealth), not income. The problem of the 'net capital growth' item, according to Bleys (2008:746), is that changes in the stock of natural capital are not considered within the index, whereas changes in the stock of human-made capital are included. So he argues that separating capital stocks and flows of services is important to be consistent with Fisherian income. While these are interesting proposals, certainly worthy of further debate, with respect to our rating system, excluding items from the basic template does not count to the total score.

Hence, there are four technical advances in the Belgian ISEW (2) over the US ISEW (2) template, as shown in *Figure 5.20* below:

Figure 5.20. Technical Advances of the Belgian ISEW (2) over the US ISEW (2) Template



KEY:
Ụ = Universal Set

Template US ISEW (2) = *Plus* ∩ *Minus*

Belgian ISEW (2) = *Plus* ∪ *Minus*

Degree of technical contribution:
¹ = minor, ² = major

Omissions = *Belgian ISEW (2)*^{C}

The dashed circle delineating element(s) in *Ụ* illustrates excluded variables from the original template

Key modifications to the existing *Template Items* = {al,ao,au}
- al = {δEnerE$_K$ | Depletion of energy resources}
- ao = {δOzoneE$_K$ | Depletion of the ozone}
- au = {δFuturE$_K$ | Long-term (future) environmental damage}

Excluded items from the basic template = *Belgian ISEW (2)*^{C} = {c,as,aw,ax}
- c = {ŝ*G*F$_K$ | Services of durable fixed public capital}
- as = {δNatHabE$_K$ | Loss of natural habitats/areas}
- aw = {ŋInv*PG*F$_K$ | Net investment of durable fixed (private and government) capital}
- ax = {ŋInt | Net international position}

Extension of the benefit items = *Plus* \ *Minus* = {d}
- d = {ŝ*G*E | Services of non-defensive public expenditures}

Extension of the cost items = *Minus* \ *Plus* = {Ø}

Evident in the figure above, there is one extension to the benefit items. And several items were excluded for the same reasons given in the Belgian ISEW (1). In general, there are four contributions (2 major, 2 minor) in the revised study.

Hence, the Belgian ISEW (2) looks much the same as the measure defined by Cobb (1994), as shown in Eq. (5.20) below:

$$\begin{aligned} \text{ISEW} = \; & \mathbf{\hat{s}}[\textit{P}\text{CE}_{*}(1\text{-DI}) + \text{CD}_K + \textit{G}\text{E} + \text{Hh}_t] \\ & - \mathbf{d\check{s}}[\text{CDE} + \textit{P}\text{AuAcc}\check{\text{D}} + \textit{P}\text{Cm}_t + \textit{P}\text{heed}\check{\text{D}}] \\ & - \mathbf{d\check{s}}\text{Poll}[\textit{P}\check{\text{D}} + \text{Noi} + \text{Air} + \text{Wat}] \\ & - \boldsymbol{\delta \text{E}_K}[\text{Ener} + \text{Ozone} + \text{Land} + \text{Futur}] \end{aligned} \qquad (5.20)$$

Services (ŝ)

$\textit{P}\text{CE}_{*}(1\text{-DI})$ = personal consumption expenditures divided by the index of distribution inequality (Atkinson, based on after tax per capita income data (deciles)

CD_K = the stock of consumer durables (annual flow of 20% from household appliances, private vehicles and durable recreational goods)

*G*E = non-defensive public expenditures (50% on general governance, 25% on defence, 25% on public order and security, 50% on economic affairs, 50% on environmental protection, 50% on health, 50% on recreation and culture, 50% on education)

Hh_t = household labour (all time spent on homework work valued at the average wage rate of domestic workers)

Disservices (dš)

CDE = consumer durable expenditures

*P*AuAccĎ	=	auto accidents (private defensive expenditures) (property damage and insurance administration costs*the number of accidents in each year)
*P*Cm$_t$	=	private commuting (percentage of private transportation costs)
*P*heedĎ	=	defensive expenditures on private health (50%) and education (50%) outlays
*P*PollĎ	=	defensive expenditures on household pollution abatement (average cost to households of waste processing facilities)
NoiPoll	=	noise pollution (marginal costs of noise generated by road traffic)
AirPoll	=	air pollution of SO_2, NO_x, PM, CO, NVMOS using marginal social costs (control/damage costs)
WatPoll	=	urban water pollution (rescaled US point estimate for 1972 spread over study period using an index of the quality of surface water for Belgium)
		Depletion of Ecological Capital (δE_K)
Ener	=	energy resources (via a non-escalating method of the replacement costs of energy as a proxy)
Ozone	=	ozone (marginal social costs of the stocks of CFCs-11,12,113, where the atmospheric lifetimes of the pollutants are taken into account)
Land	=	agricultural land via soil degradation (due to urbanisation—a cumulative process, an estimate of the forgone benefits)
Futur	=	long-term (future) environmental damage linked to greenhouse gas emissions (marginal social costs, where the atmospheric lifetimes of the stock of Co_2 is taken into account)

A key point is that he omits the 'net capital growth' item for two reasons: 1) it does not comply with the theoretical underpinning of Fisherian income; 2) it is more policy relevant to monitor stocks outside the ISEW, suggesting that supplementary 'stock accounts' "can provide information about the durability of the current level of economic welfare" (Bleys 2008:750). Excluding the so-called 'stock variables' *seems* to be, on the surface, a reasonably good advance in the literature and it shows that he understands some of the limitations of ISEW. But, we argue in *Chapter 6* that this suggestion may be theoretically unsound under Fisher's framework because the stocks of human capital are inextricably linked to net psychic income (welfare) attainment. Besides, Bleys' (2008) other solutions simply involve tinkering with the *remaining* ISEW components in order to fit the alleged theoretical foundation of Fisherian income.

Overall, the combined result for the Belgian ISEWs is that there have been 6 minor and 2 major contributions. But how innovatory is this? Interestingly the author notes, "the focus in recent years has been on the compilation of the index in more countries and on a rebranding of the index in order to gain a broader acceptance among policymakers" (Bleys 2008:746). Are the studies into the Belgian ISEWs immune to this (self-) criticism?[188] If we employed a stricter and much less sympathetic rating system, we would have arrived at a different conclusion because no true innovations were carried out—i.e. the creation of new variables that have yet to be incorporated in a study. However, the main point of this chapter is to portray the SEWIs in their best possible light through a holistic and sensitive scrutiny of the technical contributions.

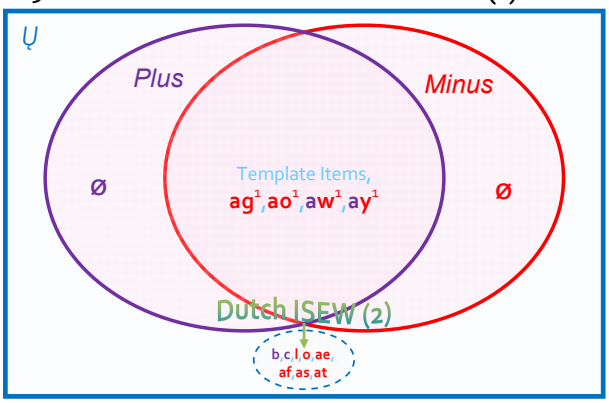
[188] As he said in the first study, "[b]uilding on the many international efforts to measure sustainable economic welfare, I have developed an analogous methodological framework for the calculation of the Index of Sustainable Economic Welfare (ISEW) for Belgium" (Bleys 2006a:34).

5.3.14 Dutch ISEW (2) – Bleys (2007a, 2007b)

The author above also constructs the Dutch ISEW (2). Bleys (2007a, 2007b) transposes the technical advances made over the US ISEW (2) from his Belgian ISEW (1) study to his study of the Netherlands. The same minor advances relate to the following variables: distribution index (DI); net investment of durable fixed private and government capital (ŋInv*PG*F$_K$); disservices of air pollution (dšAirPoll); and depletion of ozone (δOzoneE$_K$). In other words, the author of the Dutch ISEW (2) undertakes the same key modifications to the existing template items as he did for his Belgian ISEW (1) study. But more items belonging to the basic template were omitted. This is because the author wants to construct a so-called Simplified Index of Sustainable Economic Welfare (SISEW).[189]

In short, the author has achieved four minor contributions *relative to* the basic template. The four technical advances of the Dutch ISEW (2) over the US ISEW (2) template are shown in *Figure 5.21* below:

Figure 5.21. Technical Advances of the Dutch ISEW (2) over the US ISEW (2)



KEY:
Ụ = Universal Set

Template US ISEW (2) = *Plus* ∩ *Minus*

Dutch ISEW (2) = *Plus* ∪ *Minus*

Degree of technical contribution:
¹ = minor, ² = major

Omissions = *Dutch ISEW (2)*^{C}

The dashed circle delineating element(s) in *Ụ* illustrates excluded variables from the original template

Key modifications to the existing *Template Items* = {ag,ao,aw,ay}
- ag = {dšAirPoll | Disservices of air pollution}
- ao = {δOzoneE$_K$ | Depletion of the ozone}
- aw = {ŋInv*PG*F$_K$ | Net investment of durable fixed (private and government) capital}
- ay = {DI | Distribution index (adjustment)}

Excluded items from the basic template = *Dutch ISEW (2)*^{C} = {b,c,l,o,ae,af,as,at}
- b = {šCD$_K$ | Services from the stock of consumer durables}
- c = {š*G*F$_K$ | Services from durable fixed public capital}
- l = {CDE | Consumer durable expenditures}
- o = {dš*P*AuAccĎ | Disservices of auto accidents (private defensive expenditures)}
- ae = {dš*P*PollĎ | Disservices of defensive expenditures on household pollution abatement}
- af = {dšNoiPoll | Disservices of noise pollution}
- as = {δNatHabE$_K$ | Loss of natural habitats/areas}
- at = {δLandE$_K$ | Loss of agricultural land}

Extension of the benefit items = *Plus* \ *Minus* = {Ø}
Extension of the cost items = *Minus* \ *Plus* = {Ø}

Evident in the figure above, no extensions of the benefit or cost items were made and eight parameters were excluded in SISEW. In general,

[189] For sake of argument, in this chapter we refer to Bleys' SISEW study as the 'Dutch ISEW (2)'.

there are four contributions (4 minor, 0 major) to the Dutch SISEW.

Naturally, the Dutch ISEW (2) is a more condensed version than the standard template, as shown in Eq. (5.21) below:

$$\begin{aligned} \text{ISEW} = {} & \mathbf{\hat{s}}[PCE_{*}(1\text{-DI}) + G\text{heedE} + Hh_t] + \eta\text{Inv}PGF_K + \eta\text{Int} \\ & - \mathbf{d\check{s}}[PCm_t + P\text{heed}\check{D}] \\ & - \mathbf{d\check{s}}\text{Poll}[\text{Air} + \text{Wat}] \\ & - \boldsymbol{\delta E_K}[\text{Ener} + \text{Ozone} + \text{Futur}] \end{aligned} \tag{5.21}$$

Services (ŝ)

$PCE_{*}(1\text{-DI})$	=	personal consumption expenditures divided by the index of distribution inequality (Atkinson)
*G*heedE	=	non-defensive public expenditures in health (50%) and education (100%)
Hh_t	=	household labour (average wage rate of domestic workers via historical (time-varying) shadow wage rates of cleaning personnel)
$\eta\text{Inv}PGF_K$	=	net investment of durable fixed (private and government) capital ($\eta\dot{g}PGF_K = \Delta\acute{r}_{*}\eta PGF_K - \acute{r}\%\Delta\text{LaborForce}_{*}\acute{r}\eta PGF_{K(t-1)}$)
ηInt	=	net international position

Disservices (dš)

PCm_t	=	private commuting expenditures on transport, cars and other transport-related costs
*P*heedĎ	=	defensive expenditures on private health (50%) and education outlays (100%)
AirPoll	=	air pollution of SO_2, NO_x, PM, CO, NVMOS using marginal social costs (control/damage costs)
WatPoll	=	urban water pollution (derived from a Belgian Biotic Index on the quality of surface water)

Depletion of Ecological Capital (δE_K)

Ener	=	energy resources (via replacement costs of energy as a proxy)
Ozone	=	ozone (cumulative consumption of CFCs-11,12,113,114,115)
Futur	=	long-term (future) environmental damage linked to greenhouse gas emissions (discounted marginal social costs)

Unfortunately, there are no major advances to the existing template design in Eq. (5.21) above. In terms of literary contribution, the Dutch ISEW (2) is insignificant.

5.3.15 French ISEW – Nourry (2008)

Myriam Nourry (2008) presents results from a time-series analysis of eight measures of development and/or sustainability for France. Two of the eight indicators devised are a French ISEW and GPI. It would be unfair to assess this paper subject to our *relative degree of technical contribution* rating system because the ISEW and GPI only take up a small part of her analysis (see Nourry 2008:446-8,453-4). But a few general comments are necessary. Firstly, the author seems to accept Lawn's (2003) theoretical interpretation of the Fisherian concept of income but does not link in each variable to the framework.

Secondly, with respect to her French ISEW, the author practically replicates the basic template of Cobb and Cobb (1994).[190] That is, she includes all of the variables of the US ISEW (2) in Eq. (5.4), with the exception of the 'disservices of auto accident' item. Nourry (2008) places a monetary value on the human lives broken from automobile accidents

[190] Several items are excluded due to lack of data (e.g. the services from roads). The loss of natural habitats, namely wetlands, is not integrated because wetlands represent only three percent of the French territory.

(rather than valuing the private defensive expenditures on vehicle damage). She calculates the annual number of accidents that relate to the categories of 'fatal accident', 'slight injury' and 'serious injury'. This appears to be a good innovation. But this has already been integrated in former studies of the GPI (as discussed below in *Section 5.4*). There are a few other small refinements to the basic US ISEW (2) template such as including the impact of certain other air emissions, such as volatile organic compounds and carbon monoxide. Again, these adjustments are not innovations in relation to the prevailing empirical material. Overall, the French ISEW study does not make a significant contribution to the literature on SEWIs. How much better is Nourry's (2008) GPI study? Before finding out the answer, the technical specification of the US GPI (1) in comparison with the US ISEW (2) is required to put the study into a historical context.

5.4 Evolutionary Advances of the GPI over the Template ISEW

5.4.1 The US GPI – Cobb *et al.* (1995)

The US Genuine Progress Indicator by Cobb *et al.* (1995) is a significant advance over its predecessor. There is no particular theory developed since, as it is argued in *Chapter 4*, it is based on the commonsensical accountancy procedure. However, a whole host of social and ecological changes to the original US ISEW (2) template were made. The GPI is an important attempt to socialise the ISEW, i.e. *some* salient issues affecting social life, negatively or positively, are included. The defensive expenditures on crime prevention at the private level and some of the destruction of familial capital are built into the GPI. For crime, the value of stolen property, damage losses, medical costs to victims of crime, and the amount spent on locks, safe deposit boxes, burglar alarms and other electronic security systems are subtracted from personal consumption expenditures. For family disservices, they use two proxies to measure the costs of family breakdown: (1) divorce and its effects on children, and (2) the amount of time families spend watching television. Accounting for both of these issues are true innovations (major contributions).

In addition to the services of household work, the GPI authors attempt to measure the benefits of volunteer labour and parenting. Household labour is entitled, 'household work and parenting'. In principle, alteration of the headline is significant because it includes the positive aspects of looking after children as well as undertaking tasks in the home (cleaning, food preparation, maintenance etc.). But it is only a minor enhancement since it is calculated in the same way as the 'household labour' item in the US ISEWs. Yet the inclusion of volunteer

labour is a major innovation; it is a new extension of the basic template.

Private observations and social commentary of daily life in Corporatized America suggest that since the 1980s people have been saying that they work 'too hard'. They are spending too much time on the job, with less time available for leisure, family and chores. Free time is not traded in the market in the way that labour time is. Because leisure is invisible, Cobb *et al.* (1995:21) account for the loss of leisure. This is another major innovation over the ISEW.

On the other hand, many people are forced to choose leisure when they would like to be fully employed. This is the problem of underemployment. Underemployment is a more inclusive notion than unemployment. It refers to persons who are either unemployed, involuntary part-time employed (would prefer full-time work but are unable to find it), discouraged (gave up looking for work), or constrained by other factors, such as lack of transportation or childcare. There are individual and social costs of underemployment. The individual costs of underemployment fall on discouraged workers and their families. Community and society are affected when limited work opportunities may lead to frustration, suicide, violence, crime, mental illness, or alcoholism and other substance abuse. But, the value of such secondary effects of changes in the economy (e.g. erosion of social cohesion) resulting from unemployment is not measured in the US GPIs.[191] The US GPIs take a more conservative approach treating each hour of underemployment ("the number of unprovided hours for constrained workers") as a cost, just as leisure is considered a benefit. An hour of leisure time is a desirable objective whereas an hour of underemployment is a burden. The inclusion of 'underemployment' is also a considerable innovation over the ISEW.

Furthermore, accounting for the loss of native forests is a key ecological innovation over the basic US ISEW (2) template. Whenever forestland is cut for timber or to build a road, a range of ecological values is lost, at least until the forest is regenerated to the same age as the stand that has been cut. Even if successful forest management results in full restocking of the same species of timber, the original forest ecosystem may never be renewed. Replacing complex, old-growth forests with monoculture tree farms creates a distorted view that a net growing stock can be easily managed. Yet the forests or tree farms that have replaced old-growth forests are not biologically equivalent. Tree farms are productive and profitable, at least for one or two rotations of the timber stock; but they do not support the range of wildlife and soil enrichment that can be found in old-growth forests. Forest management that focuses

[191] The US GPIs also do not deal with the effects of short-term and cyclical unemployment. Although such hardships are not without social consequences and costs, in the US, much of the financial hardship is mitigated by unemployment insurance benefits.

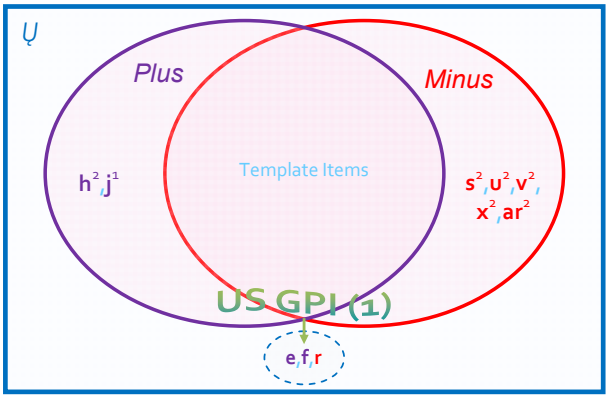
chiefly on the 'timber capital' may preclude the species complexity and thus the ecosystem services of the original forest.

Cobb *et al.* (1995) focus on two distinct, though interrelated, types of costs associated with road building and timber harvesting. One is resource loss: the reduction for timber that can be harvested in the future. The other is ecological: the destruction in species of both plants and animals. The estimate of nonmarket or environmental values is based largely on the changing stock of *old-growth* forest. This is a major innovation. Their analysis, however, focuses only on the old-growth forests of the Pacific Northwest, thus precluding analysis of the loss of ecological services that may have been realised on vast areas of other US forest lands, most of which are now managed and thus no longer in their original or old-growth state.

In estimating the cost of losing old-growth forests, they assume that the foregone benefits are directly related to the cumulative erosion of the ecosystems comprised by these forests. The authors used rates of reduction of old-growth forests in the Pacific Northwest over 1950–1997 to estimate the additional *cumulative* cost of forest decline. This is based on the premise that the value of a diminishing resource for which there is increasing demand (in this case ecological amenities) increases at a growing rate as the supply declines. Each year, they added the loss of value to the cumulative loss up to that point because the erosion of ecological services from cutting an old-growth forest does not occur in the initial year alone, but over a period of decades.

The technical advances of the US GPI (1) over the US ISEW (2) template are illustrated in *Figure 5.22* below:

Figure 5.22. Technical Advances of the US GPI (1) over the US ISEW (2)



KEY:
Ụ = Universal Set

Template US ISEW (2) = Plus ∩ Minus

US GPI (1) = Plus ∪ Minus

Degree of technical contribution:
¹ = minor, ² = major

Omissions = $US\ GPI\ (1)^C$

The dashed circle delineating element(s) in *Ụ* illustrates excluded variables from the original template

Key modifications to the existing *Template Items* = {Ø}
Excluded items from the basic template = $US\ GPI\ (1)^C$ = {e,f,r}
- e = {šGheedE | Services of non-defensive public expenditures in health and education}
- f = {šHh$_t$ | Services of household labour}
- r = {dšPheedĎ | Disservices of defensive expenditures on private health and education outlays}

Extension of the benefit items = *Plus* \ *Minus* = {h,j}
- h = {šVol$_t$ | Services of volunteer labour}
- j = {šHhFam$_t$ | Services of household work and parenting}

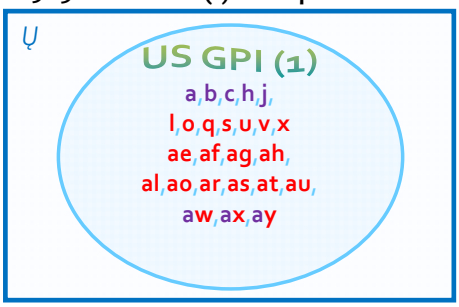
Extension of the cost items = *Minus* \ *Plus* = {s,u,v,x,ar}

- s = {dš*P*CrĎ | Disservices of defensive expenditures on crime prevention (private level)}
- u = {dšFamBr | Disservices of family breakdown}
- v = {dšLeis$_t$ | Disservices of lost leisure time}
- x = {dšUde$_t$ | Disservices of underemployment}
- ar = {δForestE$_K$ | Loss of native forests}

Apart from the improvements discussed above, the US GPI (1) also differs to the US ISEW (2) by excluding the services of non-defensive public expenditures in health and education and the disservices of defensive expenditures on private health and education outlays. These items in *Figure 5.22* were omitted with the intention of reducing arbitrariness and controversy in the index. Overall, seven innovations (1 minor, 6 major) over the US ISEW (2) have marked the US GPI (1) as a big step forward in net income indicator construction.

The US GPI (1) comprises twenty-six variables, as shown in *Figure 5.23* below:

Figure 5.23. The US GPI (1) – Template GPI



KEY:
Ụ = Universal Set
= {a,...az | all the benefit and cost variables}

Template GPI = *US GPI (1)*

US GPI (1) =
{a,...c,h,j,l,o,q,s,u,v,x,ae,...ah,al,ao,ar,
...au,aw,...ay}

- a = {ŝ*P*CE | Services from personal consumption expenditures}
- b = {ŝCD$_K$ | Services from the stock of consumer durables}
- c = {ŝ*GF*$_K$ | Services from durable fixed public capital}
- h = {ŝVol$_t$ | Services of volunteer labour}
- j = {ŝHhFam$_t$ | Services of household work and parenting}
- l = {CDE | Consumer durable expenditures}
- o = {dš*P*AuAccĎ | Disservices of auto accidents (private defensive expenditures)}
- q = {dš*P*Cm$_t$ | Disservices of private commuting}
- s = {dš*P*CrĎ | Disservices of defensive expenditures on crime prevention (private level)}
- u = {dšFamBr | Disservices of family breakdown}
- v = {dšLeis$_t$ | Disservices of lost leisure time}
- x = {dšUde$_t$ | Disservices of underemployment}
- ae = {dš*P*PollĎ | Disservices of defensive expenditures on household pollution abatement}
- af = {dšNoiPoll | Disservices of noise pollution}
- ag = {dšAirPoll | Disservices of air pollution}
- ah = {dšWatPoll | Disservices of urban water pollution}
- al = {δEnerE$_K$ | Depletion of energy resources}
- ao = {δOzoneE$_K$ | Depletion of the ozone}
- ar = {δForestE$_K$ | Loss of native forests}
- as = {δNatHabE$_K$ | Loss of wetlands and farmlands}
- at = {δLandE$_K$ | Loss of agricultural land}
- au = {δFuturE$_K$ | Long-term (future) environmental damage}
- aw = {ŋInv*PF*$_K$ | Net investment of durable fixed (private) capital}
- ax = {ŋInt | Net international position}
- ay = {DI | Distribution index (adjustment)}

A compilation of the above variables into a structured equation portrays the new and familiar items of US GPI (1), as shown in Eq. (5.22) below:

$$
\begin{aligned}
\text{GPI} = {} & \hat{\mathbf{s}}[PCE/DI_{*100} + CD_K + GF_K + Vol_t + HhFam_t] + \eta Inv PF_K + \eta Int \\
& - \mathbf{d\check{s}}[CDE + PAuAccD\check{} + PCm_t + PCrD\check{} + FamBr + Leis_t + Ude_t] \\
& - \mathbf{d\check{s}}Poll[PD\check{} + Noi + Air + Wat] \\
& - \boldsymbol{\delta E_K}[Ener + Ozone + Forest + NatHab + Land + Futur] \qquad (5.22)
\end{aligned}
$$

Services (ŝ)

*P*CE/ID*100 = personal consumption expenditures divided by the index of distribution inequality (low quintile option of the harmonic mean method, which emphasises the variations in the relationship between the highest quintile and other quintiles)

CD_K = the stock of consumer durables (annual flow of 22.5% of the net stock of cars, appliances, and furniture at the end of each year)

GF_K = durable fixed public capital (7.5% of the net stock of federal, state and local highways and streets—the annual value of services is about 10%, but 25% of all vehicle miles is assumed to be for commuting (a defensive expenditure), which leaves 75% as net benefits)

Vol_t = volunteer labour (total number of volunteer workers in a week*the average number of hours worked per week*the median weeks worked per year*real hourly wage rate)

$HhFam_t$ = household work and parenting (average wage rate of household domestic workers)

$\eta Inv PF_K$ = net investment of durable fixed (private) capital ($\eta\dot{g}PF_K = \Delta\acute{r}*\eta PF_K - \acute{r}\%\Delta LaborForce*\acute{r}\eta PF_{K(t-1)}$)

ηInt = net international position

Disservices (dš)

CDE = consumer durable expenditures

*P*AuAccD̆ = auto accidents (private defensive expenditures) (damage of vehicles)

PCm_t = private commuting (money spent to pay for transportation, and indirect cost, the value of time lost which might have been spent on other, more enjoyable or productive activities)

*P*CrD̆ = defensive expenditures on crime prevention (private level) (value of stolen property, damage losses and extent of medical costs to victims of crime, in addition the amount spent on locks, safe deposit boxes, burglar alarms and other electronic security systems)

FamBr = family breakdown vis-à-vis the cost of divorce and its effects on children (out-of-pocket expenses for legal fees, counselling, and establishing separate residences, included appliances for these—the total number of divorces*total number of children affected by these divorces), and the amount of time families spend watching television

$Leis_t$ = lost leisure time (the value of free time—time away from work minus time spent sleeping and kindred maintenance activities—that has been lost in relation to 1969, the year of greatest leisure since 1950)

Ude_t = underemployment (average real wage*number of hours per year underemployed)

*P*PollD̆ = defensive expenditures on household (private) pollution abatement

NoiPoll = noise pollution

AirPoll = air pollution of SO_2, NO_2, PM (damage to agricultural vegetation, materials damage, costs of cleaning soiled goods, acid rain damage to forests and aquatic ecosystems, urban disamenities such as the reduction in property values, and aesthetics due to loss of visibility and enjoyment in national parks and other scenic areas) (using emission levels)

WatPoll = urban water pollution (damage to water quality from point source discharges such as sewage and industrial wastes, as well as damage due to siltation that reduces the life-space of water impoundments or channels from erosion from farms, streambanks, construction sites, roadways)

Depletion of Ecological Capital (δE_K)

Ener = energy resources (a 3% annual growth of the real replacement cost of energy is used, based on increasing demands for land in alternative uses (food exports) and the rising cost of energy that is used in the manufacture of ethanol)

Ozone = ozone (cumulative production of CFCs-11,12) (human and ecological effects)

Forest = native forests (the resource *and* ecological costs associated with road building and timber harvesting—i.e. the reduction in the amount of timber that can be harvested in the future *and* the destruction of both plant and animal species in old-growth forests)

NatHab = wetlands (value per acre of the flow of services from an acre of wetland—a cumulative process)

Land = agricultural land (cumulative costs via soil degradation due to urban expansion and poor land management which destroys soil through erosion, compaction and decomposition of organic matter—all of which gradually lead to productivity loss)

Futur = long-term (future) environmental damage (ecological disruption from the cumulative consumption of fossil fuels and nuclear energy)

The US GPI (1) in Eq. (5.22) becomes the new template design and

consequently the benchmark for comparing US GPI (1) with other GPIs, as discussed in *Section 5.5* below:

5.5 Innovations Achieved over the Basic GPI Template and the Prevailing Empirical Material

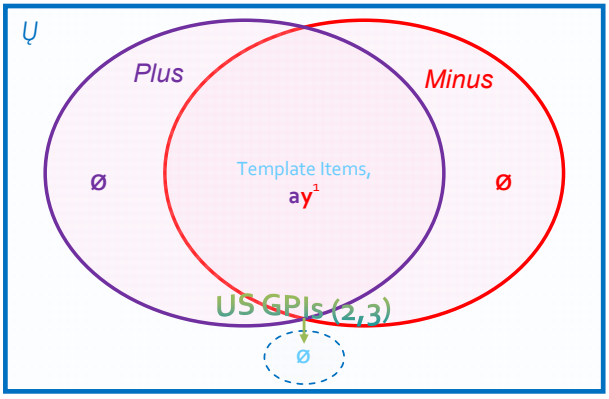
5.5.1 US GPIs (2, 3 & 4) – Anielski and Rowe (1999), Cobb *et al.* (1999), Cobb *et al.* (2000), Cobb *et al.* (2001), Venetoulis and Cobb (2004), Talberth *et al.* (2007)

Six papers have been published at *Redefining Progress* following the US GPI (1) (Cobb *et al.* 1995). The first five papers are so closely connected that it would be unjustified to evaluate them individually. In this study, the US GPIs (2) refer to the works of Anielski and Rowe (1999), Cobb *et al.* (1999), Cobb *et al.* (2000), Cobb *et al.* (2001), and the US GPI (3) relates to Venetoulis and Cobb (2004). The sixth by Talberth *et al.* (2007) is a significant revision of the US GPIs (2,3), therefore their measure, the US GPI (4), is analysed separately below. Common to all the US GPIs, however, is that there is no certain theoretical underpinning.

In comparison to the US GPI (1), one simple modification has been achieved in the US GPIs (2,3). The original GPI adopted the low-income quintile index since it gives special weight to the plight of the poorest members of society. Gini is specifically utilised in subsequent US GPIs. The use of the Gini index reflects changes in the distribution of income across all income groups. It provides a basis for studying how growing income inequality between the rich and the middle-income groups can lead to the erosion of social cohesion in a society as well as between the rich and poor. It may be more appropriate than the low-income quintile index.

Hence, incorporating a Gini income inequality index leads to a minor technical advance in the US GPIs (2,3) over the US GPI (1), as shown in *Figure 5.24* below:

Figure 5.24. Technical Advances of the US GPIs (2,3) over the US GPI (1)



KEY:
Ụ = Universal Set

Template US GPI (1) = Plus ∩ Minus
US GPI (2,3) = Plus ∪ Minus

Degree of technical contribution:
¹ = minor, ² = major

Omissions = *US GPIs (2,3)*^{C}

The dashed circle delineating element(s) in *Ụ* illustrates excluded variables from the original template

Key modifications to the existing *Template Items* = {ay}
ay = {DI | Distribution index (adjustment)}
Excluded items from the basic template = *US GPI (2,3)*^{C} = {Ø}
Extension of the benefit items = *Plus* \ *Minus* = {Ø}
Extension of the cost items = *Minus* \ *Plus* = {Ø}

Every other basic template variable remains the same. That is, no new extensions of the benefit or cost items are prevalent in the US GPIs (2,3).[192]

As a result, the five studies of the US GPIs (2,3) and their respective identities duplicate the basic US GPI (1) template design, as shown in Eqs. (5.23 to 5.27) below[193]:

$$\begin{aligned} GPI = {} & \hat{\mathbf{s}}[PCE/DI_{*}100 + CD_K + GF_K + Vol_t + HhFam_t] + \eta Inv PF_K + \eta Int \\ & - \mathbf{d\check{s}}[CDE + PAuAccD\check{} + PCm_t + PCrD\check{} + FamBr + Leis_t + Ude_t] \\ & - \mathbf{d\check{s}}Poll[PD\check{} + Noi + Air + Wat] \\ & - \boldsymbol{\delta E_K}[Ener + Ozone + Forest + NatHab + Land + Futur] \end{aligned} \qquad (5.23), \ldots (5.27)$$

Services (ŝ)

*P*CE/ID*100	=	personal consumption expenditures divided by the index of distribution inequality (Gini)
CD_K	=	the stock of consumer durables (annual flow of 22.5% of the net stock of cars, appliances, and furniture at the end of each year)
GF_K	=	durable fixed public capital (7.5% of the net stock of federal, state and local highways and streets—the annual value of services is about 10%, but 25% of all vehicle miles is assumed to be for commuting (a defensive expenditure), which leaves 75% as net benefits)
Vol_t	=	volunteer labour assuming the value of nonwork hours remained constant over time (total number of volunteer workers in a week*the average number of hours worked per week*the median weeks worked per year*the average real nonfarm wage rate per hour)
$HhFam_t$	=	household work and parenting (value of an hour of housework as equivalent to the amount that a family would have to pay to hire someone to do equivalent work in their home)
ηInv*P*F_K	=	net investment of durable fixed (private) capital
ηInt	=	net international position

Disservices (dš)

CDE	=	consumer durable expenditures
*P*AuAccD̆	=	auto accidents (private defensive expenditures) (damage of vehicles)
PCm_t	=	private commuting (money spent to pay for transportation plus indirect cost, the value of time lost which might have been spent on activities such as with family, at leisure, sleeping or at work)
*P*CrD̆	=	defensive expenditures on crime prevention (private level) (value of stolen property, damage losses and extent of medical costs to victims of crime, plus the amount spent on locks, safe deposit boxes, burglar alarms and other electronic security systems)
FamBr	=	family breakdown vis-à-vis the cost of divorce and its effects on children (out-of-pocket expenses for legal fees, counselling, and establishing separate residences, included appliances for these—the total number of divorces*total number of children affected by these divorces), plus the amount of time families spend watching television
$Leis_t$	=	lost leisure time assuming the value of nonwork hours remained constant over time, i.e. an average real wage rate is utilised (the value of free time lost in relation to 1969, the year of greatest leisure since 1950)
Ude_t	=	underemployment (average real wage*number of "unprovided hours")
*P*PollD̆	=	defensive expenditures on household (private) pollution abatement
NoiPoll	=	noise pollution
AirPoll	=	air pollution of SO_2, NO_x, PM (application of an air quality index (using relative changes in air

[192] *N.B.* US GPI (3) does not differ much to the earlier US GPIs (2), but it is labelled '3' in order to be consistent with the empirical analysis in *Chapter 4*.
[193] Sequentially, Eqs. (5.23), (5.24), (5.25), (5.26), (5.27) link to: Anielski and Rowe (1999); Cobb *et al.* (1999); Cobb *et al.* (2000); Cobb *et al.* (2001); and Venetoulis and Cobb (2004).

quality since 1975 (the benchmark year) to the estimated costs, while assuming a constant economic cost of those emissions)

WatPoll = urban water pollution (damage to water quality based on point source damage to recreation, aesthetics, ecology, property values, household and industrial water supplies, also the damage due to siltation in the form of reduced river navigability, siltation of water impoundments, sediment-related flooding, and other off-stream effects)

Depletion of Ecological Capital (δE_K)

Ener = energy resources (3% annual growth of the real replacement cost of energy based on demands for land in alternative uses (food exports) and the rising cost of energy used to produce ethanol)

Ozone = ozone (cumulative production of CFCs-11,12) (human and ecological effects)

Forest = native forests (the resource *and* ecological costs associated with road building and timber harvesting—i.e. the reduction in the amount of timber that can be harvested in the future *and* the destruction of both plant and animal species in old-growth forests)

NatHab = wetlands (annual value of ecological services lost$_*$the acres lost$_*$an estimate of the value ecological services provided by one acre of wetlands—a cumulative process)

Land = agricultural land (cumulative costs via soil degradation—due to urbanisation and poor land management which destroys soil through erosion and compaction leading to productivity loss)

Futur = long-term (future) environmental damage (ecological disruption—relative to the cumulative consumption of non-renewable energy consumption, including hydropower but excluding solar and wind power)

As is evident in Eqs. (5.23, ... 5.27) above, the rudimentary template of the GPI has remained unchanged—even after five studies (which cover nearly a decade of work at *Redefining Progress*) were devised. This may suggest that there are limits to improving the architecture of the GPI.

On the other hand, Talberth *et al.* (2007), authors of the US GPI (4), come up with some interesting revisions to the basic template design. In particular, they transcend the standard approach to the indicator's ecological aspects. For instance, a minor advance is the detail given to the human and ecological effects of ozone depletion. They extend the item to include the cumulative production of CFCs-11, 12, 113, 114, and 115; while not new to the literature, it is an advance over the existing template design—the reference point used in this study (in *Section 5.4*).

Another important and major contribution is the broader account of *primary forests*. The original GPI template gave attention only to the Pacific Northwest region. The US GPI (4) assigns ecological costs to the loss of longleaf pine forests in the southeastern US, old growth forests in the Pacific Northwest, Sierras, and southeast Alaska, and inventoried roadless areas on national forests. They also include costs associated with national forest logging roads, which are continuing sources of sedimentation, landslides, fires, and habitat fragmentation. While there are other critical forest types lost in the United States each year, these primary forest types are particularly rich in biological diversity, have been extensively studied, and have reasonable estimates of both extent and value on which GPI accounts can be based. Whenever primary forest land is cut for timber, converted into tree plantations, or cleared to build a road, use values are impaired or lost forever, e.g. scenic, recreational, and aesthetic values to nearby communities (Talberth *et al.* 2007:15). The US GPI (4) accounts measure the resource and environmental loss by assigning a price tag to year-by-year estimates of key primary forest

losses and adding such losses to the cumulative damage from previous years.

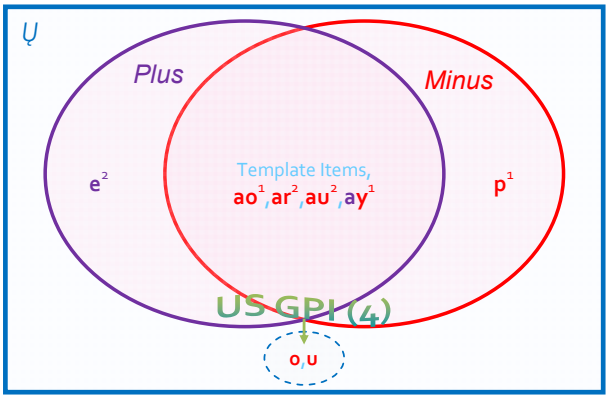
The most significant advance relates to their column on climate change. 'Global warming' is a phenomenon that threatens hundreds of millions of lives, entire cities, and the planetary economic system. The United States is by far the single greatest source of (per capita) carbon emissions implicated in that warming. The authors of the US GPI (4) assign costs to a percentage of US emissions equal to the global carbon overshoot percentage. They also assume that marginal damage increases over time due to positive feedback effects. Further, marginal damage from carbon emissions are assumed cumulative so that costs incurred in one year continue to be incurred the next year. Using this approach, they estimate carbon emissions damage to be $1.18 trillion in 2004. This is the second largest cost included in the US GPI (4). This represents a major advance of US GPI (1), as they are the first authors to explicate the *global* nature of the "long-term (future) environmental damage" item.

In addition, an indispensable aspect of the social economy is incorporated in the US GPI (4). The authors set aside the debate on the 'defensive' nature of education; instead emphasise the *services* of non-defensive public expenditures in education. There are large social spillovers from college-educated workers. They are both monetary and non-monetary and in the form of increases in the stock of knowledge, productivity of workers and capital, civic participation, job market efficiency, savings rates, research and development activities, charitable giving, and health. Ascribing positive value to education (flow variable) is a major advance over the template design.

There are two other social revisions of the US GPI (4). A minor contribution is in relation to the way the automobile accidents (AuAcc) item is considered. They include 'human injuries' (on and off the road and all injuries regardless of length of disability and address wage loss, legal, medical, hospital) as well as 'vehicle damage' (physical car damage). Interestingly, the 'disservices of family breakdown' item, dšFamBr, is excluded in the US GPI (4). No reason or implicit clue is given for the omission of this item. But it is quite possible it was dropped from the index due to the controversy of monetising this complex social problem.

The technical advances of the US GPI (4) over the US GPI (1) as discussed above are illustrated in *Figure 5.25* on page 321. The figure below reveals that there are six contributions (3 minor, 3 major) in the US GPI (4). Besides the addition of 'GedE' and the subtraction of 'dšAuAcc', the remaining four advances relate to the change in the *existing* template design. Thus, the overall alteration to the composition of the US GPI (1) is not so significant in the US GPI (4) study.

Figure 5.25. Technical Advances of the US GPI (4) over the US GPI (1)



KEY:
Ụ = Universal Set

Template US GPI (1) = *Plus* ∩ *Minus*
US GPI (4) = *Plus* ∪ *Minus*

Degree of technical contribution:
¹ = minor, ² = major

Omissions = *US GPI (4)*^{C}

The dashed circle delineating element(s) in *Ụ* illustrates excluded variables from the original template

Key modifications to the existing *Template Items* = {ao,ar,au,ay}
- ao = {δOzoneE$_K$ | Depletion of the ozone}
- ar = {δForestE$_K$ | Loss of native forests}
- au = {δFuturE$_K$ | Long-term (future) environmental damage}
- ay = {DI | Distribution index (adjustment)}

Excluded items from the basic template = *US GPI (4)*^{C} = {o,u}
- o = {dš*P*AuAccĎ | Disservices of auto accidents (private defensive expenditures)}
- u = {dšFamBr | Disservices of family breakdown}

Extension of the benefit items = *Plus* \ *Minus* = {e}
- e = {š*G*edE | Services of non-defensive public expenditures in education}

Extension of the cost items = *Minus* \ *Plus* = {p}
- p = {dšAuAcc | Disservices of automobile accidents and human injuries}

Reflecting the above modifications, the identity of the US GPI (4) is shown in Eq. (5.29) below:

$$\begin{aligned} GPI \;=\; & \mathbf{\hat{s}}[PCE/DI{*}100 + CD_K + GF_K + GedE + Vol_t + HhFam_t] + \eta Inv PBGF_K + \eta Int \\ & - \mathbf{d\check{s}}[CDE + AuAcc + PCm_t + PCr\check{D} + Leis_t + Ude_t] \\ & - \mathbf{d\check{s}}Poll[P\check{D} + Noi + Air + Wat] \\ & - \mathbf{\delta E_K}[Ener + Ozone + Forest + NatHab + Land + Futur] \end{aligned} \qquad (5.29)$$

Services (ŝ)

PCE/ID$_{*}$100 = personal consumption expenditures divided by the index of distribution inequality (Gini)
CD$_K$ = the stock of consumer durables (annual flow of 22.5% of the value of the net stock of cars, appliances, and furniture at the end of each year)
GF$_K$ = durable fixed public capital (7.5% of the net stock of federal, state and local highways and streets—the annual value of services is about 10%, but 25% of all vehicle miles is assumed to be for commuting (a defensive expenditure), which leaves 75% as net benefits)
*G*edE = non-defensive public expenditures in education (annual social benefits of higher education$_{*}$the number of people 25 years and older that had completed at least four years of college)
Vol$_t$ = volunteer labour (volunteer hours$_{*}$average hourly wage rate)
HhFam$_t$ = household work and parenting (utilising houseworker salaries)
ηInv*PF*$_K$ = net investment of durable fixed (private) capital
ηInt = net international position

Disservices (dš)

CDE = consumer durable expenditures
AuAcc = automobile accidents and human injuries (on and off the road and all injuries regardless of length of disability and address wage loss, legal, medical, hospital)
PCm$_t$ = private commuting (direct costs: the portion of non-commercial vehicle miles used in commuting including public transportation, the cost and purchase price of user operated transport, the cost of depreciation of private cars) (indirect cost: the total number of people employed each year$_{*}$the estimated annual number of hours per worker spent commuting$_{*}$a

constant value for the time)

*P*CrĎ = defensive expenditures on crime prevention (private level) (costs of crime to victims vis-à-vis stolen property or out-of-pocket expenditures, and the amount spent on locks, burglar alarms, security systems, security services)

$Leis_t$ = lost leisure time (the value of free time (average real wage rate) that has been lost in relation to 1969—time away from work minus time spent sleeping and kindred maintenance activities)

Ude_t = underemployment (average real wage*number of "unprovided hours" of work by constrained workers—people who want to work more)

*P*PollĎ = defensive expenditures on household pollution abatement

NoiPoll = noise pollution

AirPoll = air pollution of SO_2, NO_x, PM (application of an air quality index (using relative changes in air quality since 1975 (the benchmark year) to the estimated costs, while assuming a constant economic cost of those emissions)

WatPoll = urban water pollution (damage to water quality based on point source damage to recreation, aesthetics, ecology, property values, household and industrial water supplies, on top of the social and environmental damages due to siltation)

Depletion of Ecological Capital (δE_K)

Ener = energy resources (via replacement costs of renewables)

Ozone = ozone (cumulative production of CFCs-11,12,113,114,115) (human and ecological effects)

Forest = primary forests (the resource *and* ecological costs associated with the damage from logging roads *and* the destruction of forest's ability to control floods, purify air and water, maintain biological and genetic diversity, provide habitat for sensitive species)

NatHab = wetlands (the value of the ecological services that are lost when wetlands acreage is converted to other purposes—a cumulative process)

Land = agricultural land (cumulative costs of the average annual conversion of prime farmland—the lost ecosystem services lost due to urbanisation, soil erosion and compaction by heavy machinery)

Futur = long-term (future) environmental damage (excess CO_2 emissions after deducting the portion of these emissions sequestered by the world's terrestrial and aquatic ecosystems)

In short, the US GPI (4) is a relatively good contribution to the literature, especially when compared to the five earlier efforts at *Redefining Progress*.

5.5.2 Australian GPI 1 – Hamilton (1997, 1999), Hamilton and Denniss (2001)

Clive Hamilton (1997, 1999) from the *Australian Institute* devised the first Australian GPI (1a). Later Hamilton and Denniss (2001) made some noteworthy revisions, which led to the Australian GPI (1b). Erudition is what the authors had in mind when developing the Australian GPIs (1a, 1b). There is some evidence of a good theory in the Australian GPIs, albeit it is difficult to distinguish the advances made between theory and techniques. Their analyses do not specifically correspond to any one of SEWI theories in *Chapter 3*, yet the authors embrace some elements of each theory. With special attention to 'sustainable consumption', a whole series of new items and improved methodologies for the economic, social and ecological variables were instigated. The various technical advances of the Australian GPI (1a) relative to the basic US GPI (1) template are discussed below:

In the Australian GPI (1a), at the time of their study, a new variable was added to the basic GPI template: non-defensive public expenditures (*GE*). Hamilton (1997, 1999) argues that the following are non-defensive: 25% on defence and public order and safety; 50% on transport and communications; 50% on public health; 100% on recreation and culture;

and 50% on general government services. The fresh introduction of the '*G*E' item promotes greater specificity and thus it is a mark of distinction (major contribution). Another variable is subtracted to the basic GPI template, the disservices of defensive expenditures on private health and education outlays (dš*P*heedĎ). However, this item is considered only a minor advance relative to the US GPI (1) since it already appeared in the US ISEWs (1, 2).

In relation to time-based activities, the Australian GPI (1a) adopts the following strategy: that time devoted to voluntary activities makes a positive contribution to welfare while time engaged in involuntary activities diminishes welfare. The following activities diminish welfare in net terms and, as such, impose costs on the community: Involuntary leisure, i.e. the times when people fare unemployment but would prefer to be employed (including underemployment). Involuntary work, i.e. the times when we are doing paid work but would prefer not to be. Namely, 'overwork' imposes a cost on workers and their families; this is valued at the average wage rate. And time spent commuting (based on foregone earnings).

The inclusion of the costs of unemployment in the Australian GPI (1a), in this case, is a *major* contribution. Even though unemployment was first measured by Rosenberg *et al.* (1995) in their Dutch ISEW, the author of the Australian GPI (1a) has a more sophisticated analysis of the involuntary and voluntary nature of time-use. Besides, this item is valued markedly via the mental-health effects of being long-term unemployed. The psychological costs of unemployment are estimated because of the large costs "in personal terms" (Hamilton 1999:20). Likewise, the value of the psychological costs of 'underemployment' is measured by the number of part-time employees who want to work full-time. Underemployment occurs when workers' skills are underutilised or when wages, productivity or other job qualities are sub-standard. But this way of measuring underemployment is a minor refinement to the existing US GPI (1) template.

A genuinely original advance in the literature is accounting for the disservices of overwork. It is assumed that the value of an hour worked involuntarily is approximated by the average hourly wage rate. Valuing overwork at the average wage rate is a reasonable approximation. One difficulty with this is that some of the extra hours worked are paid at overtime rates. The additional payment might be seen as reflecting the additional cost in terms of leisure foregone. But, it is not valid to assume that workers were induced to work extra time by employers offering an hourly wage just high enough to compensate for lost leisure. Most workers have no choice but to work longer because their jobs would be jeopardised if they refused (Hamilton 1997).

Note that the index does not reflect a change in the stock of leisure

per se, i.e. the item, 'lost leisure time', is omitted. Paid work is the income that it generates which in turn reflects the value of output produced. Thus, it is assumed that the GPI corresponds (if only roughly) to the personal consumption base and so is already counted (see Hamilton 1999:18).[194] Nor does the index reflect changes in the services of 'household work and parenting' as such. Only the raw services of 'household labour' are added. Yet this still represents a 'minor advance' over the template. Recall that in this study any inclusion of a variable that is different to the blueprint is awarded (as a minimum) a mark of 'minor advance'. This method ensures that our final grade is somewhat conservative. Besides, the parenting aspect of the 'household labour' item is indirectly accounted for in their volunteer labour item, 'Vol_t'.

Several economic and social variables that were common to the basic template were also excluded. Consumer durable expenditures (CDE) and the services from the stock of consumer durables (ŝCD_K) were omitted because the author deemed them unnecessary adjustments. The 'disservices of family breakdown' item (dšFamBr) was left out because the authors argued that the indicator did not measure destruction of social and human capital. There was no apparent reason given for omitting the 'disservices of defensive expenditures on household pollution abatement' item (dš*P*PollĎ). Omission of some of the above variables could be considered questionable; in particular, the critical meaning of the *service* flowing from consumption seems misplaced in the Australian GPI (1a). Nonetheless, many other achievements compensate for these oversights.

Advances have been made in linking the private and work spheres to the congestion- and accident-related items. The author recognises the wider implications of the problem of commuting. To emphasise the socioeconomic nature of commuting, a small adjustment to the 'PCM_t' item is made by dropping the 'private' aspect (giving, 'CM_t'). The reason for not considering *private* commuting is that some of the congestion costs fall on businesses and commercial vehicles rather than final consumers.[195] However, a large share of the travel done in business vehicles is in fact commuting time by employees in company cars. These costs fall on commuters, in the form of erosion of leisure time, rather than on businesses. Then again, as they fall on commuters, the value of each hour is that for an individual rather than for a business. The authors assume that two-thirds of the travel time spent in business cars (but none of the travel in other commercial vehicles) is expended by

[194] Hamilton (1999:19) assumes that the net psychic benefits of work (from an individual's perspective) are equal to the loss of leisure. Therefore, paid work is valued simply by work-related income—that in turn is valued (as a proxy) by personal consumption. And likewise, lack of fulfilment from being unemployed offsets the benefits of increased leisure.

[195] They are considered intermediate input costs that are reflected in the national accounts through higher prices for goods and services.

commuters. This way of estimating congestion costs is more realistic, yet it is a minor contribution to the existing literature—it is not a radically new variable.

However, key technical innovations are accomplished when the same line of reasoning is applied to new items. The subtraction of the 'costs of industrial accidents' (dš*B*WAcc) is a major innovation. The author incorporates the costs of pain and suffering in the workplace and the losses to family and community. Moreover, rather than utilising the 'dš*P*AuAccĎ' item, which emphasises the *private* defensive expenditures from auto accidents, a new variable is introduced, the 'disservices of automobile accidents and human injuries', or for short, 'dšAuAcc'. The emphasis with this item is on the *human* damage of auto accidents as opposed to merely measuring vehicular damage. Knowledge of the mingling of private with work life, therefore, leads to both of the above items as major innovations.

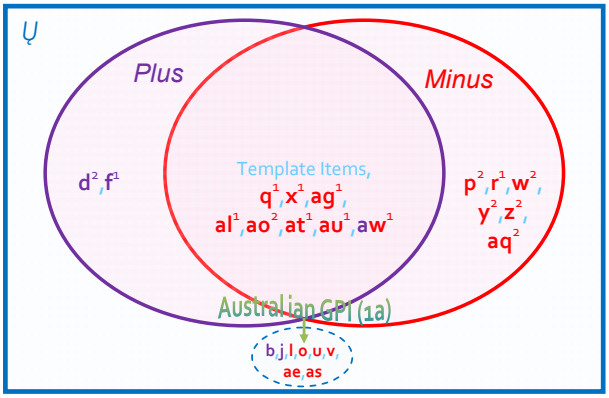
As argued in *Chapter 4*, linking the principle of 'strong sustainability' (SS) to their Australian GPI (1a) was a significant conceptual achievement. The template variables connected to the SS principle are not innovatory *on a technical level*. Specifically, the following items are minor technical innovations: net investment of durable fixed capital, the depletion of energy resources, agricultural land, and long-term (future) environmental damage. The net investment of durable fixed capital incorporates more sectors: private, business and government. Price of energy depletion is measured by the costs of shifting from petroleum and natural gas to renewables. Price of the agricultural land item is measured in terms of the loss of productive potential to current and future generations from acidification, soil structure loss and erosion measured by forgone output. For the climate change item, the annual emissions of CO_2, NO_x and methane valued by future impacts on humans and environment are calculated. Taking a strong sustainability (SS) perspective on the above economic item and three ecological variables has led to a modest advance over the standard design.

For the ozone depletion item, they measure the health costs associated with UV-B radiation in Australia. The health costs include damage to human health and to terrestrial and aquatic plants, and are directly related to the annual emissions of consumption of CFCs. Basing the adjustment on the SS principle, costs are assumed to fall steadily after 2010, reaching zero by 2030. The calculation of the human *and* environmental health effects vis-à-vis ozone depletion promotes more specificity than other studies. Hence, this item is a major contribution in the Australian GPI (1a). Also, the human and environmental effects of air pollution from noxious emissions are measured mainly by health costs. However, the disservices of air pollution were not specifically linked to the SS principle; it only counts as a minor technical contribution.

Moreover, a new ecological item is introduced in the Australian GPI (1a): the 'costs of excessive irrigation water use' (δIrrigE$_K$). The author links the problem of water degradation to Australia's largest river system, the Murray-Darling Basin (which accounts for 75 percent of irrigation water). Costs of water use measured are those associated with environmental damage due to diversions of water for irrigation purposes from Australia's river systems. To a degree, other ecological costs such as habitat destruction and salinity are indirectly captured in this item. This may explain the reason for the omission of the template item, the loss of natural habitats/areas (δNatHabE$_K$). Regardless, accounting for the depletion of the stock of water vis-à-vis excessive irrigation is a major innovation.

Based on the detailed analysis above, the technical advances of the Australian GPI (1a) over the US GPI (1) are illustrated in *Figure 5.26* below:

Figure 5.26. Technical Advances of the Australian GPI (1a) over the US GPI (1)



KEY:
Ụ = Universal Set

Template US GPI (1) = *Plus* ∩ *Minus*
Australian GPI (1a) = *Plus* ∪ *Minus*

Degree of technical contribution:
¹ = minor, ² = major

Omissions = *Australian GPI (1a)*^{C}

The dashed circle delineating element(s) in *Ụ* illustrates excluded variables from the original template

Key modifications to the existing *Template Items* = {q,x,ag,al,ao,at,au,aw}
- q = {dšCm$_t$ | Disservices of commuting}
- x = {dšUde$_t$ | Disservices of underemployment}
- ag = {dšAirPoll | Disservices of air pollution}
- al = {δEnerE$_K$ | Depletion of energy resources}
- ao = {δOzoneE$_K$ | Depletion of the ozone}
- at = {δLandE$_K$ | Loss of agricultural land}
- au = {δFuturE$_K$ | Long-term (future) environmental damage}
- aw = {ŋInv*PBG*F$_K$ | Net investment of durable fixed (private, business and government) capital}

Excluded items from the basic template = *Australian GPI (1a)*^{C} = {b,j,l,o,u,v,ae,as}
- b = {ŝCD$_K$ | Services from the stock of consumer durables}
- j = {ŝHhFam$_t$ | Services of household work and parenting}
- l = {CDE | Consumer durable expenditures}
- o = {dš*P*AuAccĎ | Disservices of auto accidents (private defensive expenditures)}
- u = {dšFamBr | Disservices of family breakdown}
- v = {dšLeis$_t$ | Disservices of lost leisure time}
- ae = {dš*P*PollĎ | Disservices of defensive expenditures on household pollution abatement}
- as = {δNatHabE$_K$ | Loss of natural habitats/areas}

Extension of the benefit items = *Plus* \ *Minus* = {d,f}
- d = {š*G*E | Services of non-defensive public expenditures}
- f = {šHh$_t$ | Services of household labour}

Extension of the cost items = *Minus* \ *Plus* = {p,r,w,y,z,aq}
- p = {dšAuAcc | Disservices of automobile accidents and human injuries}

r = {dš*P*heedĎ | Disservices of defensive expenditures on private health and education outlays}
w = {dšUe$_t$ | Disservices of unemployment}
y = {dšOvW$_t$ | Disservices of overwork}
z = {dš*B*WAcc | Disservices of industrial accidents}
aq = {δIrrigE$_K$ | Costs of excessive irrigation water use}

The above figure shows that the Australian GPI (1a) has sixteen contributions (9 minor, 7 major) to the template design. The author's creativity is exceptional with the development of eight new extensions of the cost/benefit items, six of which are especially significant.

Reflecting the extensive list of modifications, the identity of the Australian GPI (1a) is shown in Eq. (5.29) below:

$$\begin{aligned} GPI = {} & \mathbf{ŝ}[PCE/DI{*}100 + GF_K + GE + Hh_t + Vol_t] + ŋInv\mathit{PBG}F_K + ŋInt \\ & - \mathbf{dš}[AuAcc + Cm_t + \mathit{P}heedĎ + \mathit{P}CrĎ + Ue_t + Ude_t + OvW_t + \mathit{B}WAcc] \\ & - \mathbf{dš}Poll[Noi + Air + Wat] \\ & - \mathbf{\delta E_K}[Ener + Ozone + Irrig + Forest + Land + Futur] \end{aligned} \quad (5.29)$$

Services (ŝ)

*P*CE/DI$_{*100}$ = personal consumption expenditures divided by the income distribution index (share of lowest quintile in total income)
*G*F$_K$ = durable fixed public capital (7% annual flow)
*G*E = non-defensive public expenditures (25% on defence and public order and safety, 50% on transport and communications, 50% on public health, 100% on recreation and culture, 50% on general government services)
Hh$_t$ = household work (the number of hours worked per annum by the housekeeper replacement cost method (real wage rate)—excluding 100% of gardening, lawn and pool care, 50% of home maintenance, pet care, shopping and associated travel and childcare)
Vol$_t$ = volunteer labour (hours of community worked performing each year by the housekeeper replacement cost method (real wage rate))
ŋInv*PBG*F$_K$ = net investment of durable fixed (private, business and government) capital (ŋġ*PBG*F$_K$ = Δŕ$_{*}$ŋ*PBG*F$_K$ – ŕ%ΔLaborForce$_{*}$ŕŋ*PBG*F$_{K(t-1)}$)
ŋInt = net international position

Disservices (dš)

AuAcc = automobile accidents repairs and human injuries (family and community losses, pain and suffering, vehicle damage and insurance administration—excluding the costs of lost earnings and hospital, medical and rehabilitation costs to avoid double counting)
Cm$_t$ = commuting (time spent commuting valued at opportunity cost—i.e. loss of leisure due to urban sprawl and traffic congestion)
*P*heedĎ = defensive expenditures on private health and post-secondary education outlays (50% for both)
*P*CrĎ = defensive expenditures on crime prevention (private level) (property losses, insurance costs, and the costs of crime prevention and 'target hardening' (mostly non-government))
Ue$_t$ = unemployment (value of psychological costs such as trauma, stress and loss of self-esteem and impacts on the families—using estimates of the full 'labour underutilisation rate' to scale up the official levels of unemployment)
Ude$_t$ = underemployment (value of psychological costs of unemployment of part-time employees who want to work full-time)
OvW$_t$ = overwork (value of hours of work done involuntarily)
*B*WAcc = industrial accidents (costs of pain and suffering, family and community losses)
NoiPoll = noise pollution (excess noise levels valued by cost of reducing noise to an acceptable level, such as the costs of building noise barriers along roads and in homes, falling property values of homes as well as the loss of amenity)
AirPoll = air pollution (damage to humans and environment from noxious emissions measured mainly by health costs)
WatPoll = urban water pollution (damage to ecology via the control cost of improving water quality, i.e. estimating the environmental costs associated with waste water treatment and disposal)

Depletion of Ecological Capital (δE$_K$)

Ener = energy resources (costs of shifting from petroleum and natural gas to renewables)
Ozone = ozone (annual emissions valued by future impacts on humans and environment) (enhanced UV-

		B radiation damage to human health and to terrestrial and aquatic plants, where the costs are directly related to the annual emissions of consumption of CFCs)
Irrig	=	excessive irrigation water use (estimating the loss in agricultural output from reductions in water diverted to irrigation, measured by the opportunity cost of environmental flows)
Forest	=	old growth forests (environmental values denied to future generations measured by the WTP)
Land	=	agricultural land (costs to current and future generations from acidification, soil structure loss and erosion measured by forgone output—i.e. the loss of productive potential)
Futur	=	long-term (future) environmental damage (annual emissions of CO_2, NO_x and methane valued by future impacts on humans and environment)

It is obvious that the Australian GPI (1a) is innovatory and a substantial modification to the basic template design.

The Australian GPI (1b) carries all the advances from the Australian GPI (1a) study above. Yet to avoid double counting, any 'major contribution' made in the first study are counted as 'minor' in the second update. Only the relevant changes to the first GPI study are now discussed. In the revised version (1b), all personal consumption expenditures are divided by the index of distributional inequality, which the author refers to as 'the distribution of ill-health'. The difference is the choice of measurement for this item, the Atkinson index over a low quintile index. But, this is a minor refinement given that Jackson *et al.* (1997) had already undertaken such an adjustment in their UK ISEW.

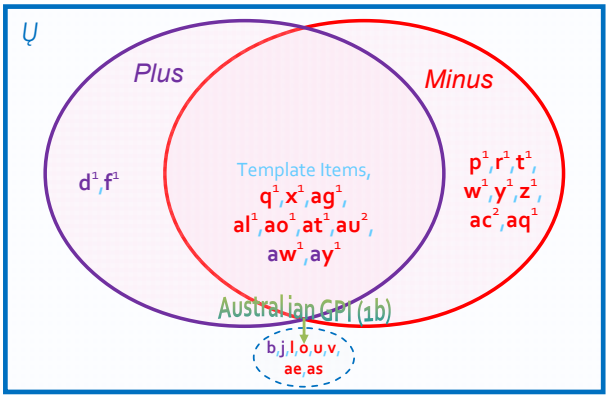
In comparison to the US GPI (1) template design, accounting for the disservices of advertising and gambling are two advances in the Australian GPI (1b). 50 percent of the expenditure on the placement of advertisements in the main media is subtracted from consumption expenditure. This portion of advertising is assumed to provide no information, i.e. the amount of harm done by the placement of advertisements that provide disinformation. However, this is a 'minor advance' since Zolotas (1981) in his EAW and Daly and Cobb (1989) in their US ISEW already included a deduction item for advertising. But an original item is developed in the Australian GPI (1b): the disservices of gambling expenditures. To measure the social costs of gambling, they use the proportion of expenditure on gambling attributable to problem gamblers, which is the difference between the amount wagered and the amount won. The inclusion of this item is new in the literature, hence it is a major innovation.

The Australian GPI (1b) estimate of the costs of greenhouse gas emissions is methodologically more robust. They use the amount that would need to be 'set aside' to offset or compensate for the damage from climate change in the next century. Setting aside money at the time of emission would generate a fund that would compound over time. Their estimate is more conservative compared to other GPIs (e.g. Cobb *et al.* 1995), around thirty percent lower of the estimated costs for the 'long-term (future) environmental damage' item. This has significance in view of Neumayer's (1999, 2000) critique: that the climate change item has an excessive influence on the empirical trend. Therefore, it is deemed a

major contribution since Hamilton and Denniss (2001) make good advances in debating this important subject matter.

In summary, the notable differences between the first and second revision of the Australian GPI (1) are the inclusion of the disservices of advertising and gambling, and the improvement in the distributional inequality index and long-term (future) environmental damage items. In relation to the Australian GPI (1b) over US GPI (1), the technical advances include the four items aforesaid and a series of minor modifications that were accomplished in the first study, as shown in *Figure 5.27* below:

Figure 5.27. Technical Advances of the Australian GPI (1b) over the US GPI (1)



KEY:
Ụ = Universal Set

Template US GPI (1) = Plus ∩ Minus
Australian GPI (1b) = Plus ∪ Minus

Degree of technical contribution:
¹ = minor, ² = major

Omissions = *Australian GPI (1b)*^{C}

The dashed circle delineating element(s) in *Ụ* illustrates excluded variables from the original template

Key modifications to the existing *Template Items* = {q,x,ag,al,ao,at,au,aw,ay}
- q = {dšCm$_t$ | Disservices of commuting}
- x = {dšUde$_t$ | Disservices of underemployment}
- ag = {dšAirPoll | Disservices of air pollution}
- al = {δEnerE$_K$ | Depletion of energy resources}
- ao = {δOzoneE$_K$ | Depletion of the ozone}
- at = {δLandE$_K$ | Loss of agricultural land}
- au = {δFuturE$_K$ | Long-term (future) environmental damage}
- aw = {ŋInv*PBG*F$_K$ | Net investment of durable fixed (private, business and government) capital}
- ay = {DI | Distribution index (adjustment)}

Excluded items from the basic template = *Australian GPI (1b)*^{C} = {b,j,l,o,u,v,ae,as}
- b = {ŝCD$_K$ | Services from the stock of consumer durables}
- j = {ŝHhFam$_t$ | Services of household work and parenting}
- l = {CDE | Consumer durable expenditures}
- o = {dš*P*AuAccĎ | Disservices of auto accidents (private defensive expenditures)}
- u = {dšFamBr | Disservices of family breakdown}
- v = {dšLeis$_t$ | Disservices of lost leisure time}
- ae = {dš*P*PollĎ | Disservices of defensive expenditures on household pollution abatement}
- as = {δNatHabE$_K$ | Loss of natural habitats/areas}

Extension of the benefit items = *Plus* \ *Minus* = {d,f}
- d = {š*G*E | Services of non-defensive public expenditures}
- f = {šHh$_t$ | Services of household labour}

Extension of the cost items = *Minus* \ *Plus* = {p,r,t,w,y,z,ac,aq}
- p = {dšAuAcc | Disservices of automobile accidents and human injuries}
- r = {dš*P*heedĎ | Disservices of defensive expenditures on private health and education outlays}
- t = {dšAd | Disservices of advertising}
- w = {dšUe$_t$ | Disservices of unemployment}
- y = {dšOvW$_t$ | Disservices of overwork}
- z = {dš*B*WAcc | Disservices of industrial accidents}
- ac = {dšGamE | Disservices of problem gambling expenditures}

aq = {δIrrigE$_K$ | Costs of excessive irrigation water use}

In the above figure, there are nineteen advances (17 minor and 2 major). With only one major innovation that extended the basic template design, the Australian GPI (1b) makes a less significant advance than the previous version (1a).

The identity of the Australian GPI (1b) reflects these modifications such as subtraction of the 'Ad' and 'GamE' items, as shown in Eq. (5.30) below:

$$\begin{aligned} GPI = {} & \hat{\mathbf{s}}[PCE_{*}(1\text{-}DI) + GF_K + GE + Hh_t + Vol_t] + \eta Inv PBGF_K + \eta Int \\ & - \mathbf{d\check{s}}[AuAcc + PCm_t + PheedD\check{} + PCrD\check{} + Ad + Ue_t + Ude_t + OvW_t + BWAcc + GamE] \\ & - \mathbf{d\check{s}}Poll[Noi + Air + Wat] \\ & - \boldsymbol{\delta E_K}[Ener + Ozone + Irrig + Forest + Land + Futur] \end{aligned} \quad (5.30)$$

Services (ŝ)

$PCE_{*}(1\text{-}DI)$	=	personal consumption expenditures divided by the index of distribution inequality (Atkinson)
GF_K	=	durable fixed public capital (7% annual flow)
GE	=	non-defensive public expenditures (25% on defence and public order and safety, 50% on transport and communications, 50% on public health, 100% on recreation and culture, 50% on general government services)
Hh_t	=	household work (the number of hours worked per annum by the housekeeper replacement cost method (real wage rate))
Vol_t	=	volunteer labour (hours of community worked performing each year by the housekeeper replacement cost method (real wage rate))
$\eta Inv PBGF_K$	=	net investment of durable fixed (private, business and government) capital ($\eta\dot{g}PBGF_K = \Delta\acute{r}_{*}\eta PBGF_K - \acute{r}\%\Delta LaborForce_{*}\acute{r}\eta PBGF_{K(t\text{-}1)}$)
ηInt	=	net international position

Disservices (dš)

AuAcc	=	automobile accidents repairs and human injuries (family and community losses, pain and suffering, vehicle damage and insurance administration—excluding the costs of lost earnings and hospital, medical and rehabilitation costs)
Cm_t	=	commuting (time spent commuting valued at opportunity cost—due to urban sprawl and traffic congestion)
$PheedD\check{}$	=	defensive expenditures on private health and post-secondary education outlays (50% for both)
$PCrD\check{}$	=	defensive expenditures on crime prevention (private level) (property losses, insurance costs, and the costs of crime prevention and 'target hardening' (mostly non-government))
Ad	=	advertising (50% of expenditure on the placement of advertisements in the main media (television, radio, print, outdoor, cinemas))
Ue_t	=	unemployment (value of hours of idleness of the unemployed including discouraged workers)
Ude_t	=	underemployment (value of hours of idleness of part-time employees who want to work full-time)
OvW_t	=	overwork (value of hours of work done involuntarily)
BWAcc	=	industrial accidents (costs of pain and suffering, family and community losses)
GamE	=	gambling expenditures (proportion of expenditure on gambling (the difference between the amount wagered and the amount won) attributable to problem gamblers)
NoiPoll	=	noise pollution (excess noise levels valued by cost of reducing noise to an acceptable level, such as the costs of building noise barriers along roads and in homes, falling property values of homes as well as the loss of amenity)
AirPoll	=	air pollution (damage to humans and environment from noxious emissions via health costs)
WatPoll	=	urban water pollution (damage to ecology via the control cost of improving water quality, i.e. estimating the environmental costs associated with waste water treatment and disposal)

Depletion of Ecological Capital (δE_K)

Ener	=	energy resources (costs of shifting from petroleum and natural gas to renewables)
Ozone	=	ozone (annual emissions valued by future impacts on humans and environment) (enhanced UV-B radiation damage to human health and to terrestrial and aquatic plants, where the costs are directly related to the annual emissions of consumption of CFCs)
Irrig	=	excessive irrigation water use (estimating the loss in agricultural output from reductions in

water diverted to irrigation, measured by the opportunity cost of environmental flows)

Forest = old growth forests (environmental values denied to future generations measured by the WTP)

Land = agricultural land (costs to current and future generations from soil erosion, acid soils and salinity measured by forgone output)

Futur = long-term (future) environmental damage (annual emissions of CO_2, NO_x and methane valued by future impacts on humans and environment—estimated contribution of each tonne of emissions to the damage it is expected to cause in the future)

The Australian GPI (1b) attempts to improve upon an already highly innovatory first version, making it a very good contribution to literature—albeit not as innovative as version 1a.

5.5.3 Albertan GPI – Anielski (2001)

Notwithstanding the lack of theory, the Albertan GPI by Mark Anielski (2001) is the most sophisticated design yet, beginning with an analysis of the 'costs of salinity' item. Salinity limits crop growth. Poor water management practices (e.g. over-irrigation), poor drainage and canal seepage are significant causes of soil salinity. The problem occurs in both dryland farming and in irrigation agriculture. Dryland salinity is a major soil degradation problem on the Canadian prairies. The trouble occurs in coulee bottoms and in depressions and sloughs, where groundwater redistributes salts in the soil and they accumulate at the surface. Salinity becomes more severe after a few wet years.

In irrigated agricultural areas, salinity results from excess water. Salts leach out of the soil, remaining on the surface. The water evaporates and the plants die. Soil salinity thus hinders plant growth. High levels of salt in the soil have the same effect as drought, making less water available for uptake by plant roots and lowering crop yields. The author has assumed that salinity causes an average reduction in crop yields of 25 percent across the province and that the entire cultivated area affected by dryland salinity is sown to barley.[196] Barley is more tolerant of salinity than wheat, canola, beans or peas, so it is most likely to be grown on saline land. Estimating the costs of salinity (δSalinEK) is a major innovation.

Accounting for the loss of wetlands *and* peatlands in the 'δNatHabEK' item is also significant. Peatlands play a vital ecological role as a filtration system for water and by controlling water runoff. Peatlands absorb water from spring snowmelt and summer storms, thus reducing flooding, erosion and sedimentation, and recharging the water table in times of drought. They are natural filters, cleansing the water that passes through them. In addition they store a massive amount of carbon. Hence, the author assumes that a decrease in the annual carbon sequestration by peatlands results in an increase of carbon in the atmosphere; leading to

[196] This is a conservative estimate. In areas of high salinity, where plants will not grow at all, and in areas affected by moderate to severe salinity, annual yields of most cereal and oilseed crops are reduced by up to 50 percent (Anielski 2001).

an annual loss in net peatland carbon sequestration. The consideration of the ecological cost of this issue is a major refinement to the existing GPI template.

For the social items, the author divides unpaid 'time' into three main activities: passive leisure (television viewing, reading and listening to music); socializing (in homes, restaurants and bars); and active leisure (attending and participating in entertainment and sports events). For instance, volunteer labour (Vol_t) includes some of these forms, including both formal and informal volunteerism but not civic work. Two of the basic template items are excluded: 'household work and parenting' and 'lost leisure time'. In their place, the 'services household labour' (Hh_t), 'services of parenting and eldercare' ($FamCare_t$), and the 'services of leisure labour' ($Leis_t$) are added. Household labour includes meal preparation, cleaning, clothing care, repair and maintenance, other domestic work. Parenting and eldercare includes childcare and adult care that takes place within the home. Leisure labour is the time that is not allocated to paid or unpaid work or to personal care such as sleep, meals, washing, dressing, relaxing and naps. Time-based activities in the Albertan GPI are valued at so-called replacement costs: what you would have to pay someone else to perform the function on your behalf. That is, the actual replacement value for a worker who could perform the service is the replacement cost.

Accounting for parenting and eldercare is a major innovation as it highlights the importance of caring for younger and older generations. Accounting for the services of household and leisure labour are less significant because they are not original contributions to the literature (minor advances). The author also makes some minor advances in relation to other time-use variables: the costs of private commuting (PCm_t) and unemployment (Ue_t). Following in the footsteps of the Australian GPI (1), Anielski (2001) incorporates a value of the leisure time lost due time spent commuting in a personal automobile, bus or on the subway and subtracts the value of time spent unemployed.

Several items in the Albertan GPI have been simply transposed from the Australian GPI (1b) by Hamilton and Denniss (2001). The disservices of problem gambling (dšGamE) and automobile accidents and human injuries (dšAuAcc) are adapted for the province of Alberta.[197] 50 percent of the services of non-defensive public expenditures (ŝGE) are included as well. And the 'air pollution' item is more detailed than the US GPI (1) utilising a wider variety of pollutants. Similarly to the Australian study (1), the health and environmental costs associated with SO_2, NO_x, VOCs and

[197] The 'dš*P*AuAccĎ' variable, the disservices of auto accidents (private defensive expenditures), is therefore omitted. Also, the following items are excluded: dš*P*PollĎ (disservices of defensive expenditures on household pollution abatement); dšNoiPoll (disservices of noise pollution); and δOzoneEk (depletion of the ozone). The reason for their omission is unspecified.

CO_2 are measured. Likewise, the measurement method of the long-term (future) environmental damage item (δFuturEK) is imitated. This item is measured by the global environmental and health liability cost of carbon emissions. The recycling of these items are not major innovations (they are minor refinements).

In addition, two ecological items have been customised from the Australian SNBI study by Lawn and Sanders (1999). The Albertan GPI incorporates the depletion of timber resources (δTimbEK) as the cost of unsustainable timber resource use, i.e. loss in pulp production value. The disservices of municipal solid waste pollution (dšWasPoll) are subtracted from the index. This includes the operational costs of collection, transportation and disposal of waste for waste management, and environmental costs of solid waste in a lined landfill with leachate collection. Obviously, the inclusion of these items is not innovatory because the author has emulated a former work; they are counted as minor advances.

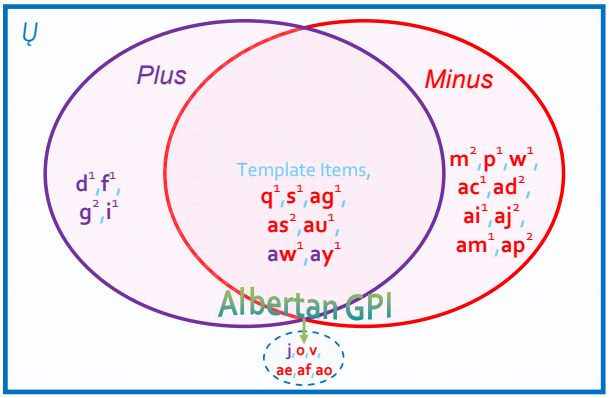
However, Anielski (2001) does not merely replicate the works of others. He has devised three original variables: *P*DebtE, private debt expenditures; dšSu, disservices of suicide; and dšToxWasPoll, disservices of toxic waste liabilities. Private debt expenditures are household debt servicing based on an estimate of the interest payments on chartered bank consumer loans. The critical social problem of suicide is measured by direct and indirect costs. Direct costs are medical expenses including ambulance, hospital, physician, autopsy, funeral/cremation, as well as the 'services' of policy investigations. The indirect societal costs of suicide are calculated in terms of lost productivity. Waste disposal has contaminated former industrial sites and leaking underground storage tanks require costly replacement, therefore this item in the Albertan GPI is significant. Toxic waste liabilities are measured by the costs associated with cleaning up old industrial sites and environmental costs. The inclusion of private debt, the disservices of suicide and toxic waste liabilities are excellent advances to the literature and thus major innovations.

Three miscellaneous variables are minor advances in the Albertan GPI. Firstly, he utilises Gini for after-tax and after-government transfer income for the measurement of the distribution of income (DI). Secondly, the author tries to link current and future well-being aspects. He assumes that to achieve so-called "sustainability", the regional stock of public infrastructure must be enough to support the labour force on an ongoing basis. The capital stock must be maintained to ensure adequate support for the *current* year's economic production. This ensures the ability of *future* generations to produce goods and services. In other words, when the labour force increases so too must the government capital needed to support it. The net investment of durable

fixed (government) capital (ŋInv*G*F$_K$) is hence a minor refinement to an existing variable in the template. Thirdly, Anielski (2001) measures the defensive expenditures on crime prevention (policing, prison operations, private investigators and security, courts, corrections and legal aid, locks, security devices, and lost property). This small improvement in the technique for calculating the *social* (rather than individual) costs of crime (CrĎ) is also a minor advance.

Based on the detailed analysis, the technical advances of the Albertan GPI over the US GPI (1) are illustrated in *Figure 5.28* below:

Figure 5.28. Technical Advances of the Albertan GPI over the US GPI (1)



KEY:
Ụ = Universal Set

Template US GPI (1) = Plus ∩ Minus
Albertan GPI = Plus ∪ Minus

Degree of technical contribution:
¹ = minor, ² = major

Omissions = *Albertan GPI*^{C}

The dashed circle delineating element(s) in *Ụ* illustrates excluded variables from the original template

Key modifications to the existing *Template Items* = {q,s,ag,as,au,aw}
- q = {dš*P*Cm$_t$ | Disservices of private commuting}
- s = {dšCrĎ | Disservices of defensive expenditures on crime prevention}
- ag = {dšAirPoll | Disservices of air pollution}
- as = {δNatHabE$_K$ | Loss of wetlands and peatlands}
- au = {δFuturE$_K$ | Long-term (future) environmental damage}
- aw = {ŋInv*G*F$_K$ | Net investment of durable fixed (government) capital}
- ay = {DI | Distribution index (adjustment)}

Excluded items from the basic template = *Albertan GPI*^{C} = {j,o,v,ae,af}
- j = {šHhFam$_t$ | Services of household work and parenting}
- o = {dš*P*AuAccĎ | Disservices of auto accidents (private defensive expenditures)}
- v = {dšLeis$_t$ | Disservices of lost leisure time}
- ae = {dš*P*PollĎ | Disservices of defensive expenditures on household pollution abatement}
- af = {dšNoiPoll | Disservices of noise pollution}
- ao = {δOzoneE$_K$ | Depletion of the ozone}

Extension of the benefit items = *Plus* \ *Minus* = {d,f,g,i}
- d = {š*G*E | Services of non-defensive public expenditures}
- f = {šHh$_t$ | Services of household labour}
- g = {šFamCare$_t$ | Services of parenting and eldercare}
- i = {šLeis$_t$ | Services of leisure labour}

Extension of the cost items = *Minus* \ *Plus* = {m,p,w,ac,ad,ai,aj,am,ap}
- m = {*P*DebtE | Private debt expenditures}
- p = {dšAuAcc | Disservices of automobile accidents and human injuries}
- w = {dšUe$_t$ | Disservices of unemployment}
- ac = {dšGamE | Disservices of problem gambling expenditures}
- ad = {dšSu | Disservices of suicide}
- ai = {dšWasPoll | Disservices of municipal solid waste pollution}
- aj = {dšToxWasPoll | Disservices of toxic waste liabilities}
- am = {δTimbE$_K$ | Depletion of timber resources}
- ap = {δSalinE$_K$ | Costs of salinity}

The above figure shows that the Albertan GPI has twenty contributions (14 minor, 6 major) to the template design. He has developed four new extensions of the benefit items and nine new extensions of the cost items. And by modifying seven key variables of the US GPI (1) study, the author's resourcefulness is considerable.

Reflecting the refinements made, the identity of the Albertan GPI is shown in Eq. (5.31) below:

$$\begin{aligned} GPI = {} & \mathbf{\hat{s}}[PCE/DI_{*}100 + CD_K + GF_K + GE + Hh_t + FamCare_t + Vol_t + Leis_t] + \eta InvGF_K + \eta Int \\ & - \mathbf{d\check{s}}[CDE + PDebtE + AuAcc + PCm_t + Cr\check{D} + FamBr + Ue_t + Ude_t + GamE + Su] \\ & - \mathbf{d\check{s}}Poll[Air + Wat + Was + ToxWas] \\ & - \mathbf{\delta E_K}[Ener + Timb + Salin + Forest + NatHab + Land + Futur] \end{aligned} \quad (5.31)$$

Services (ŝ)

*P*CE/DI$_{*}$100 = personal consumption expenditures divided by the distribution inequality index (Gini for after-tax and after government-transfer income)

CD_K = the stock of consumer durables (22.5% of the estimated stock value of household infrastructure)

GF_K = durable fixed public capital (7% of the stock value of roads, bridges, publicly owned utilities, machinery and equipment, engineering structures and buildings)

*G*E = non-defensive public expenditures (50%)

Hh_t = household labour includes meal preparation, cleaning, clothing care, repair and maintenance and other domestic work (pet care, for example) using replacement cost generalist method (average time spent (hours per person per year)$_{*}$imputed costs)

$FamCare_t$ = parenting and eldercare, includes child care and adult care that takes place within the home (average time spent (hours per person per year)$_{*}$imputed costs)

Vol_t = volunteer labour including both formal and informal volunteerism but not civic work (average time spent (hours per person per year)$_{*}$imputed costs)

$Leis_t$ = leisure labour as time that is not allocated to paid or unpaid work or to personal care such as sleep, meals, washing, dressing, relaxing and naps (measured as the value of the increase in free time from 1961, the base year, i.e. hours of free time gained or lost$_{*}$the average real wage rate)

$\eta InvGF_K$ = net investment of durable fixed (public) capital ($\eta\dot{g}GF_K = \Delta\acute{r}_{*}\eta GF_K - \acute{r}\%\Delta LaborForce_{*}\acute{r}\eta GF_{K(t-1)}$)

ηInt = net international position

Disservices (dš)

CDE = consumer durable expenditures

*P*DebtE = private debt expenditures (household debt servicing based on an estimate of the interest payments on chartered bank consumer loans)

AuAcc = automobile accidents and human injuries (direct costs including automobile repairs, insurance payouts, hospitalization, property damage, forgone income taxes, plus indirect costs of the time value of lost work and income due to injury)

PCm_t = private commuting (time spent commuting (personal automobile, bus or subway) related to unpaid work, valued at what could have been earned had the commuter spent the same amount of time at work) (and the direct expenditures incurred, such as motor vehicle parts and repairs, fuels and lubricants, and auto-related services in travelling to and from work)

CrĎ = defensive expenditures on crime prevention (policing, prison operations, private investigators and security, courts, corrections and legal aid, locks, security devices, and lost property)

FamBr = family breakdown vis-à-vis the cost of divorce and its effects on children (expenses for divorce lawyers, counselling, courts, establishing two new households where one previously existed)

Ue_t = unemployment (number of hours per week (40 hours)$_{*}$the average wage rate for each year in the study period,$_{*}$48, which is the number of work weeks in a year)

Ude_t = underemployment, workers who are working part-time but would prefer to be working full-time (involuntary part-time employment) (number of hours of lost work per year$_{*}$the average wage rate for the same year)

GamE = gambling expenditures (proportion of all gambling money wagered by the problem gamblers)

Su = suicide (direct medical costs including ambulance, hospital, physician, autopsy, funeral/cremation, and services policy investigations, plus indirect societal costs in terms of lost productivity, not including attempted suicide)

AirPoll = air pollution of SO_2, NO_x, VOCs, CO_2 (health and environmental costs of air pollutants,

calculated per tonne of greenhouse gas emissions)

WatPoll = urban water pollution (damage to ecology via the control cost of improving water quality, i.e. estimating the environmental costs associated with wastewater treatment and disposal)

WasPoll = municipal solid waste pollution (operational costs of collection, transportation and disposal of waste for waste management, and environmental costs of solid waste in a lined landfill with leachate collection (cost per tonne*the total volume of municipal waste in the particular year)

ToxWas = toxic waste liabilities (on-site release of pollutants as a proxy for the on-site storage of hazardous waste)

Depletion of Ecological Capital (δE_K)

Ener = energy resources (economic rent value of depletion of oil, natural gas, gas by-products and coal reserves (inventories))

Timb = timber resources (cost of unsustainable timber resource use (loss in pulp production value)

Salin = salinity (reduction in yields due to salinity on dryland and irrigated cropland, assuming that the saline land is used to grow barley and that yields are reduced by 25%)

Forest = native forests (cost of non-timber forest values due to change in productive forest, e.g. fishing, trapping, hunting, camping, aboriginal land use, biodiversity maintenance, carbon sequestration)

NatHab = wetlands (ecosystem functions lost when wetlands are drained and lost due to development of roads, agriculture or other types of land use wildlife and fish habitat; control of flood and storm water; water quality; shoreline protection; groundwater; and aesthetics, recreation and education estimated—cumulative loss) and peatlands (annual loss in net peatland carbon sequestration and water regulation services and the volume of peat harvested per year)

Land = agricultural land (cost of erosion on bare soil on cultivated land (on-site and offsite), including damages by wind erosion to exterior paint, landscaping, health, recreation, etc.—utilising the area of Alberta's cropland that was in summerfallow on an annual basis)

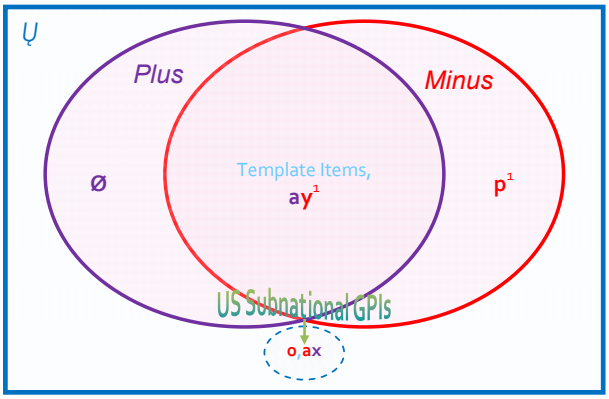
Futur = long-term (future) environmental damage measured by the global environmental and health liability cost of carbon emissions

With thirty-two variables in Eq. (5.31), the Albertan GPI is the most innovatory of all studies and a considerable modification to the basic template design.

5.5.4 Vermont, Chittenden County and Burlington (US) GPIs – Costanza *et al.* (2004)

In comparison with the US GPI (1), Costanza *et al.* (2004) in their US Subnational GPIs for Vermont, Chittenden County and Burlington undertake two simple changes, and still no theory is provided. The original GPI adopted the low-income quintile index since it gives special weight to the plight of the poorest members of society. Instead, the Gini index of income inequality is utilised. The other relates to the 'disservices of automobile accidents and human injuries' item (dšAuAcc). This is an advance over the template because of omission of the 'private' element of car accidents and the inclusion of valuing human injuries and death. This is a fuller accounting approach. But, this adjustment is not an original contribution; for instance, it was already undertaken in the Dutch ISEW (1) and Albertan GPI studies. Hence, incorporating a Gini index and the human effects of automobile accidents results in two minor technical advances in the US Subnational GPIs vis-à-vis the US GPI (1), as shown in *Figure 5.29* below:

Figure 5.29. Technical Advances of the US Subnational GPIs over the US GPI (1)



KEY:
Ụ = Universal Set

Template US GPI (1) = *Plus* ∩ *Minus*
US Subnational GPIs= *Plus* ∪ *Minus*

Degree of technical contribution:
¹ = minor, ² = major

Omissions = *US Subnational GPIs*^{C}

The dashed circle delineating element(s) in *Ụ* illustrates excluded variables from the original template

Key modifications to the existing *Template Items* = {ay}
ay = {DI | Distribution index (adjustment)}
Excluded items from the basic template = *US Subnational GPIs*^{C} = {o,ax}
o = {dš*P*AuAccĎ | Disservices of auto accidents (private defensive expenditures)}
ax = {ŋInt | Net international position}
Extension of the benefit items = *Plus* \ *Minus* = {Ø}
Extension of the cost items = *Minus* \ *Plus* = {p}
p = {dšAuAcc | Disservices of automobile accidents and human injuries}

In the above figure, there are two contributions (2 minor, 0 major) attributable to the US Subnational GPIs.

With only one minor advance that extended the basic template design, predictably, the identity of the US Subnational GPIs duplicates the US GPI (1), as shown in Eq. (5.32) below:

$$\begin{aligned} \text{GPIs} = {} & \hat{\mathbf{s}}[PCE/DI{*}100 + CD_K + GF_K + Vol_t + HhFam_t] + \eta Inv PF_K \\ & - \mathbf{d\check{s}}[CDE + AuAcc + PCm_t + PCr\check{D} + FamBr + Leis_t + Ude_t] \\ & - \mathbf{d\check{s}}Poll[P\check{D} + Noi + Air + Wat] \\ & - \boldsymbol{\delta}\mathbf{E}_K[Ener + Ozone + Forest + NatHab + Land + Futur] \end{aligned} \tag{5.32}$$

Services (ŝ)

*PCE/ID**100 = personal consumption expenditures divided by the index of distribution inequality (Gini)
CD_K = the stock of consumer durables (annual flow of 12.5% of the net stock)
GF_K = durable fixed public capital (7.5% of the net stock of highways and streets—the annual value of services is about 10%, but with 75% of all miles are driven for pleasure)
Vol_t = volunteer labour (volunteer hours*average hourly wage rate)
$HhFam_t$ = household work and parenting (hours spent on housework by gender*hourly wage for maids, housecleaners and cleaners)
$\eta Inv PF_K$ = net investment of durable fixed (private) capital ($\eta\dot{g}PF_K = \Delta\acute{r}{*}\eta PF_K - \acute{r}\%\Delta LaborForce{*}\acute{r}\eta PF_{K(t-1)}$)

Disservices (dš)

CDE = consumer durable expenditures (per capita personal income for each scale*ratio of consumer durables to personal income from national data)
AuAcc = automobile accidents (direct costs including property damage and healthcare expenditures) and human injuries (indirect costs including lost wages, pain and suffering)
PCm_t = private commuting (direct costs for vehicle purchase and maintenance, cost of public transportation and an indirect cost for lost time)
*P*CrĎ = defensive expenditures on crime prevention (private level) (out-of-pocket expenditures, value of stolen property, and the defensive expenditures to prevent or avoid crime)
FamBr = family breakdown (cost of divorce and the amount of time families spend watching television)
$Leis_t$ = lost leisure time (employment level*estimated lost leisure hours*average hourly wage rate)
Ude_t = underemployment (total number of underemployed persons*unprovided hours per constrained worker*average hourly wage rate)

*P*PollĎ	=	defensive expenditures on household (private) automobile emission abatement expenditures, septic system installation and cleaning costs, solid waste disposal costs
NoiPoll	=	noise pollution (*WHO*'s noise pollution damage estimate*urbanization index values)
AirPoll	=	air pollution of SO_2, NO_x, PM (via application of an air quality index)
WatPoll	=	urban water pollution (total benefit of unimpaired water*percentage of impaired waters)
		Depletion of Ecological Capital (δE_K)
Ener	=	energy resources via replacement costs (oil consumption levels in barrel equivalents*estimated cost of replacing one barrel of oil with a renewable resource)
Ozone	=	ozone (cumulative production of CFCs-11,12) (human and ecological effects)
Forest	=	native forests (change in forest cover*value estimated for temperate and boreal forests)
NatHab	=	wetlands (estimated loss of wetlands*acre value*inflation value to reflect scarcity—cumulative)
Land	=	agricultural land (urbanisation rate*estimated value of farmland per acre—cumulative totals)
Futur	=	long-term (future) environmental damage (cumulative oil consumption levels in barrel equivalents*per barrel oil tax)

As is evident in Eq. (5.31) above, the elementary template of the US GPI (1) has remained unchanged. Purely in terms of the technical advances achieved over basic design, the US Subnational GPIs contribute negligibly to the literature.

5.5.5 Victorian and Australian GPIs – Lawn and Clarke (2006a, 2006b), Clarke and Lawn (2005, 2007)

Many economic activities serve either a rehabilitation purpose (e.g. medical procedures and vehicle accident repairs) or to protect a nation's citizens from the negative side-effects of past and present human endeavours (e.g. flood mitigation projects and crime). Defensive and rehabilitative expenditures are not welfare-enhancing as "they merely serve to maintain and restore the productive capacity of the economy" (Lawn and Clarke 2006b:22). Although a clear benefit emerges from such expenditure, the impact is not incurred in the current period but in later years by way of future consumption. The authors of the Victorian and Australian GPIs argue that it is double counting to *include* this type of defensive and rehabilitative spending. For example, welfare-reducing spending on tobacco products by individuals should be excluded from the measure of 'personal consumption expenditures' due to its negative health consequences.[198] Hence, the first adjustment to private and public consumption considers an array of defensive, rehabilitative, and welfare-reducing expenditures.

An austere approach to defensive and rehabilitative expenditure adjustments to consumption has been adopted in the Victorian/Australian GPI (2). The selection of these exclusions from the Australian System of National Accounts is 'normative'. When undertaking such adjustments, there are elements of both the entropic net psychic income (theory two) and the social welfare function (theory three). The adjustments are outlined as follows. It is assumed that half of the expenditure in the following categories is either defensive or

[198] Here, tobacco expenditures are *private* expenditures and not government health-aware campaigns that attempt to reduce smoking.

rehabilitative in nature: rent and other dwelling services; electricity, gas, and fuel; operation of vehicles (includes vehicle repairs and servicing); transport services (conducted for commuting purposes); communications; insurance and other financial services.

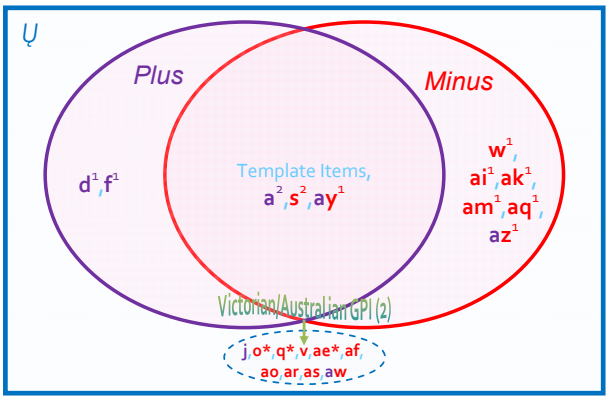
Half of the expenditures on alcoholic beverages and food are assumed defensive, whereas cigarettes and tobacco are assumed to make no positive contribution to well-being. One-quarter of all expenditure in hotels, cafes, and restaurants is defensive. Finally, half of private and public health expenditures are defensive or rehabilitative, and one-quarter of government final consumption is assumed defensive. Therefore, the richness of the adjustments to the services from personal consumption expenditures item (ŝ*P*CE) is a major contribution. Yet, the degree of modification to the services of non-defensive public expenditures item (ŝ*G*E) is lower; hence, the addition of this variable is a minor advance.

Furthermore, the authors incorporate five parameters, which are extensions of the cost items in the US GPI (1): disservices of unemployment (dšUe$_t$); depletion of mineral resources (δMineE$_K$); depletion of timber resources (δTimbE$_K$); costs of excessive irrigation water use (δIrrigE$_K$); and an Ecosystem Health Index (EHI) adjustment. However, all five variables utilised to construct their Victorian/Australian GPI (2) are not original contributions to the literature. Therefore, they are counted as minor advances as they have already been incorporated in other studies (e.g. from the Australian SNBI, which is discussed in *Section 5.6* below). But their crime parameter is a unique adjustment. The focus shifts from the 'defensive expenditure' aspect of crime to the personal harassment caused by homicide, assault, robbery, break and entry, motor vehicle theft, and other theft related activities. Accounting for the disservices of crime (dšCr) utilising this technique is a major advance, as the standard template procedure only takes into consideration the defensive outlays on consumer goods (locks, security doors, alarm systems etc.).

Many parameters common to the US GPI (1) template were omitted in the Victorian GPI and Australian GPI (2). The authors do not provide reasons for their exclusions.[199] It appears that setting up a comparative analysis of sustainable well-being between the subnational and national level was the paramount factor. The technical advances of the Victorian/Australian GPI (2) over the US GPI (1) are illustrated in *Figure 5.30* below:

[199] For instance, the authors overlook the 'services of household work *and* parenting' (ŝHhFam$_t$) yet include the 'services of household labour' (ŝHh$_t$) instead (a minor advance). Moreover, note that the series of defensive and rehabilitative adjustments to personal consumption expenditures implicitly include the disservices of auto accidents ('dš*P*AuAccĎ'), private commuting ('dšPCm$_t$'), and the defensive expenditures on household pollution abatement ('dš*P*PollĎ'). However, they are explicitly omitted in the Victorian/Australian GPI (2).

Figure 5.30. Technical Advances of the Victorian/Australian GPI (2) over the US GPI (1)



KEY:
Ụ = Universal Set

Template US GPI (1) = *Plus* ∩ *Minus*
Victorian/Australian GPI (2) = *Plus* ∪ *Minus*

Degree of technical contribution:
¹ = minor, ² = major

Omissions = *Victorian/Australian GPI (2)*^{C}

The dashed circle delineating element(s) in *Ụ* illustrates excluded variables from the original template

Key modifications to the existing *Template Items* = {a,s,ay}
- a = {ŝ*P*CE | Services from personal consumption expenditures}
- s = {dšCr | Disservices of crime}
- ay = {DI | Distribution index (adjustment)}

Excluded items from the basic template = *Victorian/Australian GPI (2)*^{C} = {j,o,q,v,ae,af,ao,ar,as,aw}
- j = {ŝHhFam$_t$ | Services of household work and parenting}
- o = {dš*P*AuAccĎ | Disservices of auto accidents (private defensive expenditures)}
- q = {dš*P*Cm$_t$ | Disservices of private commuting}
- v = {dšLeis$_t$ | Disservices of lost leisure time}
- ae = {dš*P*PollĎ | Disservices of defensive expenditures on household pollution abatement}
- af = {dšNoiPoll | Disservices of noise pollution}
- ao = {δOzoneE$_K$ | Depletion of the ozone}
- ar = {δForestE$_K$ | Loss of native forests}
- as = {δNatHabE$_K$ | Loss of natural habitats}
- aw = {ŋInv*PF*$_K$ | Net investment of durable fixed (private) capital}

Extension of the benefit items = *Plus* \ *Minus* = {d,f}
- d = {ŝ*G*E | Services of non-defensive public expenditures}
- f = {ŝHh$_t$ | Services of household labour}

Extension of the cost items = *Minus* \ *Plus* = {w,ai,ak,am,aw,az}
- w = {dšUe$_t$ | Disservices of unemployment}
- ai = {dšWasPoll | Disservices of municipal solid waste pollution}
- ak = {δMineE$_K$ | Depletion of mineral resources}
- am = {δTimbE$_K$ | Depletion of timber resources}
- aq = {δIrrigE$_K$ | Costs of excessive irrigation water use}
- az = {EHI | Ecosystem Health Index (adjustment)}

As shown in the figure above, three key modifications to the existing template items are undertaken and ten variables were excluded.[200] Eight extensions of the benefit/cost variables are made. In short, the Victorian/Australian GPI (2) has eleven contributions (9 minor, 2 major) to the template design.

The identities of the Victorian GPI and the Australian GPI (2) are shown in Eqs. (5.33) and (5.34) below:

[200] The way the 'DI' variable is adjusted in the Victorian/Australian GPI (2) is a bit different from the standard approach in the US GPI (1). Hence, it is a minor advance. The authors adjust their measure essentially same way as was already done in the Fisherian Income indicator, which is discussed in *Section 5.6.2* below.

$$GPIs = (\hat{s}PCE + \hat{s}GE - CDE + \hat{s}CD_K)/DI*100 + \hat{\mathbf{s}}[GF_K + Hh_t + Vol_t] + \eta Int - \mathbf{d\check{s}}[Cr + FamBr + Ue_t + Ude_t] - (\boldsymbol{\delta E_K}[AirPoll + WatPoll + Mine + Ener + Timb + Irrig + Land + Futur])/EHI*100 \quad (5.33, 5.34)$$

Services (ŝ)

*P*CE	=	personal consumption expenditures
*G*E	=	non-defensive public expenditures
CDE	=	consumer durable expenditures (clothing, footwear, furnishings, household equipment, vehicles)
DI	=	income distribution index (ratio of the median annual income to per capita GSP or GDP)
CD_K	=	the stock of consumer durables (10% annual depreciation flow)
GF_K	=	durable fixed public capital (75% of public sector consumption of fixed capital, i.e. 75% of all government investment spending is on service capital rather than producer goods)
Hh_t	=	household labour by net opportunity cost (real value of an hour of non-paid household work)
Vol_t	=	volunteer labour by net opportunity cost (real value of an hour of volunteer work)
ηInt	=	net international position (i.e. change in foreign debt)

Disservices (dš)

Cr	=	crime (homicide, assault, robbery, break and entry, motor vehicle theft, and other theft)
FamBr	=	family breakdown (divorce rate as a proxy for family disunity and dysfunctionality based on legal fees, counselling costs, disruption to children, psychological impact)
Ue_t	=	unemployment (number of underutilised labour*estimate cost per unemployed person)
Ude_t	=	underemployment (number of underutilised labour*estimate cost per unemployed person)

Depletion of Ecological Capital (δE_K)

AirPoll	=	air pollution (via a constructed air pollution index)
WatPoll	=	urban water pollution (via a constructed water pollution index)
WasPoll	=	municipal solid waste pollution (via a constructed waste-water pollution index)
Ener	=	energy resources by user cost (the amount to set aside to sustain a flow of income equal to that generated by the exhausted resource)
Timb	=	timber resources via user cost, when the rate of timber stocks harvested exceeds the natural regeneration rate (separate values attached to native forest timber, woodland forest timber, plantation timber-broadleaved, and plantation timber-coniferous)
Irrig	=	excessive irrigation water use (estimating the loss in agricultural output from reductions in water diverted to irrigation, measured by the opportunity cost of environmental flows)
Land	=	agricultural land (amount required to compensate citizens for the cumulative impact of past and present agricultural practices)
Futur	=	long-term (future) environmental damage (annual consumption of energy converted to a crude oil barrel equivalent—cumulative figure is equivalent to the amount needed to compensate future generations for the excessive use of energy resources)
EHI	=	Ecosystem Health Index (adjustment) (lost life-support functions, landcover disturbance surveys)

Overall, there are some good technical advances to the Victorian/Australian GPI (2) over the basic template, mainly due to their adaptations of earlier efforts and their excellent investigation of defensive and rehabilitative expenditures.

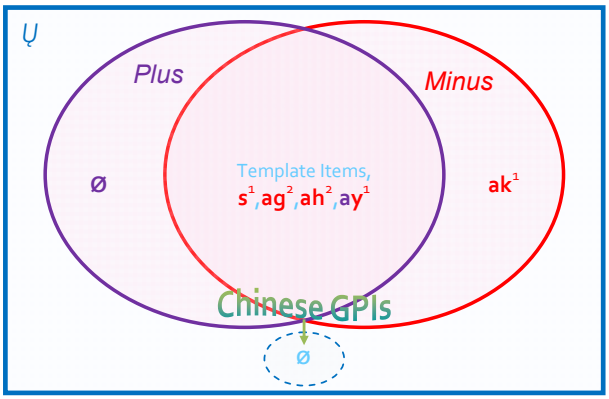
5.5.6 Chinese GPIs – Wen *et al.* (2007)

Wen *et al.* (2007), authors of the Chinese GPIs (Suzhou, Yangzhou, Ningbo, Guangzhou), do not develop or follow a particular theory. Yet, they make a few advances to the US GPI (1) template. They estimate the costs of *health problems* caused by environmental pollution and the expenditures of pollution control and treatment. For air pollution, they have utilised the average concentration of various air pollutants as a guide to work out the costs. In reference to the international experience, the relationship between environmental quality and the death rate or

morbidity of a disease caused by pollution was constructed and adjusted based on surveys on the medical treatment cases and environmental quality in the four cities. For water pollution, the opportunity and restoration cost approaches were utilised. The opportunity cost approach included the costs of health loss, medical expenditures, and income loss for absence from work caused by water-related illness. Expenditures for the treatment of wastewater and the expense of construction of drainage pipe networks are utilised in the restoration cost method.[201]

Thus, authors of the Chinese GPIs have greater specificity of the health costs of pollution than earlier studies. Therefore, accounting for the disservices of air pollution (dšAirPoll) and water pollution (dšWatPoll) represent major refinements. Lastly, three minor refinements in the Chinese GPIs prevail over the basic template: the Gini coefficient is used instead of the low-quintile index; crime is looked at from the private and public levels; and the depletion of mineral resources is calculated. The five technical advances of the Chinese GPIs over the US GPI (1) are illustrated in *Figure 5.31* below:

Figure 5.31. Technical Advances of the Chinese GPIs over the US GPI (1)



KEY:
Ụ = Universal Set

Template US GPI (1) = *Plus* ∩ *Minus*
Chinese GPIs= *Plus* ∪ *Minus*

Degree of technical contribution:
¹ = minor, ² = major

Omissions = *Chinese GPIs*^{C}

The dashed circle delineating element(s) in *Ụ* illustrates excluded variables from the original template

Key modifications to the existing *Template Items* = {s,ag,ah,ay}
- s = {dš*PG*Cr | Disservices of crime (private and government level)}
- ag = {dšAirPoll | Disservices of air pollution}
- ah = {dšWatPoll | Disservices of urban water pollution}
- ay = {DI | Distribution index (adjustment)}

Excluded items from the basic template = *Chinese GPIs*^{C} = {Ø}
Extension of the benefit items = *Plus* \ *Minus* = {Ø}
Extension of the cost items = *Minus* \ *Plus* = {ak}
- ak = {δMineE_K | Depletion of mineral resources}

In the figure above, there are four key modifications to the existing template and one cost item was extended. Overall, there are five contributions (3 minor, 2 major).

[201] Specifically, two methods were used to calculate value of health and life vis-à-vis air and water pollution: Willingness-to-pay (WTP) and the Human Capital Approach (HCA). For instance, HCA was used in transforming these pathological losses such as hospitalisation and sick leaves into monetary cost. Besides the wage loss caused by premature deaths and work absence, the medical treatment expenditures on diseases were also considered.

The modified variables and the inclusion of the cost item (δMineE$_K$, depletion of mineral resources) over the basic template in the Chinese GPIs are reflected in Eq. (5.35) below:

$$\begin{aligned}\text{GPIs} = {} & \hat{\mathbf{s}}[P\text{CE/DI}_{*100} + \text{CD}_K + G\text{F}_K + \text{Vol}_t + \text{HhFam}_t] + \eta\text{Inv}P\text{F}_K + \eta\text{Int} \\ & - \mathbf{d\check{s}}[\text{CDE} + P\text{AuAcc}\check{\text{D}} + P\text{Cm}_t + P\text{Cr}\check{\text{D}} + \text{FamBr} + \text{Leis}_t + \text{Ude}_t] \\ & - \mathbf{d\check{s}}\text{Poll}[P\check{\text{D}} + \text{Noi} + \text{Air} + \text{Wat}] \\ & - \boldsymbol{\delta}\mathbf{E}_\mathbf{K}[\text{Mine} + \text{Ener} + \text{Ozone} + \text{Forest} + \text{NatHab} + \text{Land} + \text{Futur}] \end{aligned} \quad (5.35)$$

Services (ŝ)

PCE/ID$_{*100}$	=	personal consumption expenditures divided by the index of distribution inequality (Gini)
CD$_K$	=	the stock of consumer durables
GF$_K$	=	durable fixed public capital (highways and streets)
Vol$_t$	=	volunteer labour (estimated annual hours allocated to volunteer work$_*$the market prices of these local services)
HhFam$_t$	=	household work and parenting (estimated annual hours allocated to housework$_*$the market prices of these local services)
ηInv$P$F$_K$	=	net investment of durable fixed (private) capital
ηInt	=	net international position

Disservices (dš)

CDE	=	consumer durable expenditures
PAuAcc$\check{\text{D}}$	=	auto accidents (private defensive expenditures) (medical and repair costs)
PCm$_t$	=	private commuting (indirect cost)
PGCr	=	outlays on crime prevention (private level—expenditures on property insurance) (government level—budgets of public security, court of justice, procurator activity, and police)
FamBr	=	family breakdown (direct cost to the adults involved and the indirect cost to the children affected by divorce, based on an estimate of the expenses for legal fees and counselling)
Leis$_t$	=	lost leisure time (value of every nonworking hour of leisure, estimated by the average wage rate)
Ude$_t$	=	underemployment
PPoll$\check{\text{D}}$	=	defensive expenditures on household (private) pollution abatement (utilising sales of air and water filters)
NoiPoll	=	noise pollution (contingent valuation and benefit transfer approach)
AirPoll	=	air pollution of NO_x, SO_2 and suspended particulates (TSP) based on the average concentration of air pollutant (the cost of health damage, expenditures of visits to the physician, and the wage loss from the days off work)
WatPoll	=	urban water pollution (change of morbidity and the physical damage on health based on the infectious rate from water pollution)

Depletion of Ecological Capital (δE$_K$)

Mine	=	mineral resources via net price method, where the rent from extracted resources is required to be reinvested (equal to the cost of depletion) (using the market value of extracted mineral resources of copper, iron, and zinc minus the average extraction cost)
Ener	=	energy resources (via net price method where the rent from the extracted resources is required to reinvested—the rent is equal to the cost of the depletion—the market value of extracted energy resources of coal, crude oil, diesel and natural gases minus the average extraction cost)
Ozone	=	ozone (environmental unit cost and the accumulative amount of ozone depleting chemicals consumption since 1980)
Forest	=	native forests (based on the change in the reserve of the old-growth forests)
NatHab	=	wetlands (estimating the value of ecological service functions lost when wetland's acreage is converted to other purposes—due to the conversion to farmlands to raise food productivity)
Land	=	agricultural land (urbanization, and poor land management leading to the deterioration of soil from erosion, over cultivation, and loss of water) (the costs of the following losses productivity capacity; environmental service functions; prevention and control; and land rents)
Futur	=	long-term (future) environmental damage (environmental unit cost and the accumulative amount of CO_2 emissions)

Overall, the five advances of Chinese GPIs in Eq. (5.34) are satisfactory, but at this stage of the research—twelve years have passed since the launch of the US GPI—they are mild improvements over the template

and over the prevailing empirical material.

5.5.7 French GPI – Nourry (2008)

Nourry (2008) calculates both a ISEW and GPI for France. As mentioned in *Section 5.3.15*, it would not be fair to subject this paper to our rating classification because the focal point of her paper is on the construction of six other 'sustainable development' indicators. She only devotes a small amount of writing space to the ISEW/GPI. Besides, much like before with her ISEW study, there are no outstanding contributions. The difference between the French GPI and US GPI (1) is minimal; there is not a single technical (major or minor) advance in the French GPI. In terms of the technical literary scope of SEWIs, this study represents a step backwards.

5.6 Innovations Achieved over the ISEW/GPI Templates and the Prevailing Empirical Material

In this final major section, two measures that are based on the ISEW and GPI are discussed. They are the Sustainable Net Benefit Index (SNBI) and Fisherian Income (YF) studies. Both of these indicators are calculated for Australia. Essentially, the indices are structural derivatives of the ISEW/GPI. Yet, as argued in *Chapter 4*, the *theoretical* underpinning of the SNBI and YF is probably better than the ISEW/GPI. But this chapter is purely concerned with the relative degree of *technical* contributions. Here, the comparative analysis centres on the major and/or minor technical advances made *in relation to* the combined templates of the US ISEW (1) and US GPI (1), beginning with the Australian SNBI by Lawn and Sanders (1999) and Lawn (2001) in *Section 5.6.1* below:

5.6.1 Australian SNBI – Lawn and Sanders (1999), Lawn (2001)

To calculate a SNBI, measures of psychic income, psychic outgo and the depletion of the stock of ecological capital are required. The psychic income is enjoyed from either the use and/or consumption of wealth as well as from the process of wealth creation itself. Consider annual expenditure on consumer durables. Because the life of consumer durables exceeds one year, the current expenditures on consumer durables cannot be recorded as an act of personal consumption. The amount paid for consumer durables reflects the psychic income consumers expect to enjoy over the full time it takes to consume, degrade, or depreciate consumer durables. As such, it is necessary to subtract current expenditure on consumer durables. It has been assumed that the value of these services is equal to an annual depreciation value of 15 percent per year.

However, only one technical advance is made in the psychic income account.[202] They add in the psychic services of leisure labour (ŝLeis$_t$). Accounting for the benefits of leisure is a *major* contribution despite the fact that it was previously incorporated in the US MEW and EAW. The authors of the US ISEW (1) and GPI (1) avoid measuring leisure in order to avoid controversy. Conversely, the authors of the SNBI are the first, and bold enough to reintroduce the undeniable welfare aspects of leisure. Hence, we consider the reinsertion of this item as a major advance.

Secondly, the disservices deplored but nonetheless experienced from economic activity—psychic outgo—also need to be identified and valued. A large portion of the human-made capital produced each year does not contribute to the psychic income of a nation. It is produced to prevent the undesirable side-effects of the economic process reducing the psychic income enjoyed in the future. These are "non-welfare-increasing expenditures". Therefore, a range of defensive and rehabilitative expenditures are considered in the SNBI, such as some medical and dental expenditures, the cost of vehicle repairs, crime prevention measures, and efforts to both rehabilitate and protect the natural environment from the impacts of economic activity.

In their SNBI, several of the items in the US ISEW (1) and US GPI (1) have been improved but nothing new has been created. The defensive expenditures of crime (*P*CrĎ) are measured by not only the theft of privately owned property (excluding the cost of crime inflicted upon the business and public sector) but also the cost of being confined indoors at particular times of the day or night or to particular places. The air pollution variable (dšAirPoll) is divided into two accounts: the psychic outgo aspect and the part linked to the ecological degradation account. 40 percent of the total cost of air pollution was assumed the appropriate proportion for the negative effect on people's psyche.[203] The authors measure the direct disamenity cost of air pollution (NO_2, SO_2 and PM) that affects urban property value, wages and urban aesthetics. They have incorporated an important 'psychic disservice' item into their SNBI: the costs of unemployment (Ue$_t$), which is measured by multiplying the number of unemployed persons seeking either full-time or part-time work by the average real hourly wage. These three parameters, Ue$_t$, *P*CrĎ, dšAirPoll, are minor advances over the basic templates.

Thirdly, constructing an 'uncancelled cost' account is necessary to ascertain the extent to which the natural environment's source–sink and life-support functions have been lost during each accounting period. The 'uncancelled cost' account or the 'depletion of ecological capital' account

[202] Linking each component to 'psychic income' (or to psychic outgo etc.) is not a technical achievement *per se*, but an advance in theory, which was already graded in *Chapter 4*.

[203] The remaining share (60 percent) of the total costs of the air pollution is assumed to be caused by the waste assimilative capacity of the natural environment having been exceeded. This reflects the loss of ecosphere's sink function.

is subtracted from the index. The cost of lost natural capital services should include the full range of source, sink, and life-support functions sacrificed in supplying the throughput of matter-energy needed to keep the stock of human-made capital intact. Estimating the cost of sacrificed source and sink functions is frequently undertaken in the net income studies (e.g. the cost of resource depletion and pollution). However, it is very difficult to estimate the cost of losing some of the *life-support services* provided by critical ecosystems.

To overcome this problem, Lawn applies an Ecosystem Health Index (EHI) to the 'uncancelled cost' account. In essence, this adjustment highlights the extent of ecosystem degradation. The EHI is based on the premise that remnant vegetation loss constitutes the greatest threat to biodiversity and, therefore, to ecosystem functioning. The impact of most resource extractive and pollutive activities is not confined to the erosion of the ecosphere's source and sink functions. A good example is agriculture, which first requires the clearance of native vegetation. Hence, to account for the loss of the ecosphere's life-support function, an EHI is calculated.

The sum total of the cost of lost ecological capital services is weighted in line with changes in an EHI. A base index value of 100 is assigned to the first year of the study period and is adjusted corresponding to the annual changes in the area of relatively undisturbed land. The annual cost of lost natural capital services is then divided by the index value and multiplied by 100. A decrease/increase in the area of relatively undisturbed land results in an upward/downward weighting of lost natural capital services. By including an EHI adjustment, Lawn makes a major innovation in the literature on net income indicators as a whole (and hence to the existing templates of the ISEW and GPI).

Moreover, the Australian SNBI has achieved five more major advances in the environmental components. Accounting for the disservices of the municipal solid waste pollution (dšWasPoll), which is an 'ecological sink' variable, is a new contribution to the literature. The other four advances are linked to the extent to which the 'ecological source' function has been lost.[204] The user (depletion) cost of metallic and non-metallic minerals is utilised for the 'δMineEK' item.[205] A net stock value is utilised for timber resources (δTimbEK) and fish resources (δFishEK). Empirically their values are negative over the period of study,

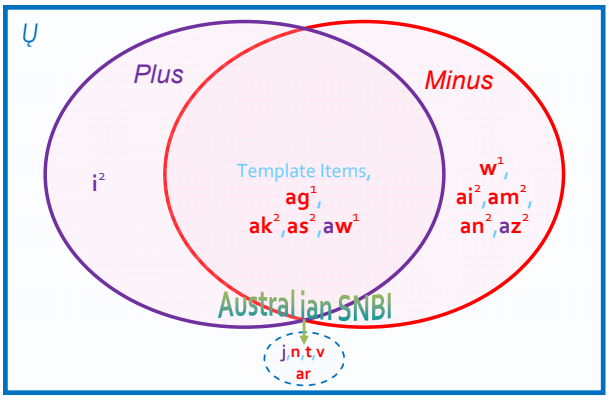
[204] The degree to which the source function has been sacrificed is determined primarily by three factors: (a) the rate at which both renewable and non-renewable resources have been harvested or mined; (b) the regeneration rate of renewable resources; and (c) the extent to which renewable resources have been cultivated to offset the depletion of non-renewable resources (see Lawn and Sanders 1999:224).

[205] The user cost or the amount of total net receipts that must be set aside to establish a replacement asset to ensure a perpetual income stream. In comparison to Daly and Cobb (1989), the authors of the SNBI measure the 'depletion of mineral resources' with more specificity. Hence, this item is a major advance over the US ISEW/GPI (1) template.

that is, the rate of timber and fish stocks harvested exceeded their natural regeneration rate. For timber resources, the authors attach separate values to native forest timber, woodland forest timber, plantation timber-broadleaved, and plantation timber-coniferous. Fishery resources include the stocks of prawns, rock lobster, abalone, scallops, oysters, fish (excluding tuna), and tuna. Accounting for the depletion of timber and fishery stocks is full of originality (major *innovations*). For the 'loss of natural habitats' item (δNatHabEK), separate values are attached to the hectares lost or degraded wetlands, mangroves, and saltmarshes. The authors have made strong progress in SEWI literature with inclusion of the depletion of the mineral, timber, fishery, mangroves and saltmarshes resources in the SNBI.

The technical advances of the Australian SNBI over the US ISEW/GPI (1) are illustrated in *Figure 5.32* below:

Figure 5.32. Technical Advances of the Australian SNBI over the US ISEW/GPI (1)



KEY:
Ụ = Universal Set
Template US ISEW/GPI (1) = *Plus* ∩ *Minus*
Australian SNBI = *Plus* ∪ *Minus*

Degree of technical contribution:
¹ = minor, ² = major

Omissions = *Australian SNBI*^{C}
The dashed circle delineating element(s) in *Ụ* illustrates excluded variables from the original template

Template US ISEW/GPI (1) =
{a,...c,e,f,h,j,l,n,o,q,...v,x,ae,...ah,ak, al,ao,ar,...au,aw,...ay}

Key modifications to the existing *Template Items* = {ag,ak,as,aw}
- ag = {dšAirPoll | Disservices of air pollution}
- ak = {δMineE$_K$ | Depletion of mineral resources}
- as = {δNatHabE$_K$ | Loss of wetlands, mangroves and saltmarshes}
- aw = {ŋInv*B*F$_K$ | Net investment of durable fixed (business) capital}

Excluded items from the basic template = *Australian SNBI*^{C} = {j,n,t,v,ar}
- j = {šHhFam$_t$ | Services of household work and parenting}
- n = {dš*P*Urban | Disservices of the disamenities of urbanization (private level)}
- t = {dšAd | Disservices of advertising}
- v = {dšLeis$_t$ | Disservices of lost leisure time}
- ar = {δForestE$_K$ | Loss of native forests}

Extension of the benefit items = *Plus* \ *Minus* = {i}
- i = {šLeis$_t$ | Services of leisure labour}

Extension of the cost items = *Minus* \ *Plus* = {w,ai,am,an,az}
- w = {dšUe$_t$ | Disservices of unemployment}
- ai = {dšWasPoll | Disservices of municipal solid waste pollution}
- am = {δTimbE$_K$ | Depletion of timber resources}
- an = {δFishE$_K$ | Depletion of fishery resources}
- az = {EHI | Ecosystem Health Index (adjustment)}

The author's creativity is outstanding, especially considering the very well developed ecological cost items. The above figure shows that the Australian SNBI has ten contributions (3 minor, 7 major) over the

template design.

Reflecting the wide list of modifications linked to Fisher's notion of income and capital, the identity of the Australian SNBI is shown in Eq. (5.36) below:

$$\begin{aligned} SNBI = {} & \hat{\mathbf{s}}[PCE/DI_{*}100 + CD_K + GF_K + GheedE + Hh_t + Vol_t + Leis_t] + \eta InvBF_K + \eta Int \\ & - \mathbf{d\check{s}}[CDE + PAuAccD\check{} + PCm_t + PheedD\check{} + PCr + FamBr + Ue_t + Ude_t + PD\check{}Poll + NoiPoll + AirPoll] \\ & - (\boldsymbol{\delta E_K}[Air + Wat + Was + Mine + Ener + Timb + Fish + Ozone + NatHab + Land + Futur])/EHI_{*}100 \end{aligned} \quad (5.36)$$

Psychic Services (ŝ)

$PCE/DI_{*}100$	=	personal consumption expenditures divided by the index of distributional inequality (Gini)
CD_K	=	the stock of consumer durables (depreciation value of 15%)
GF_K	=	durable fixed public capital an annual (imputed service (rental) flow of 11.5% for public dwellings, roads and highways)
*G*heedE	=	non-defensive public expenditures in health and education (50% for both)
Hh_t	=	household labour (gross opportunity cost of an hour of unpaid household work based on an average hourly real wage)
Vol_t	=	volunteer labour (total hours of voluntary volunteer work*average yearly hourly real wage)
$Leis_t$	=	leisure labour (the number of hours in a day minus the average daily number of non-leisure hours of Australians aged 15 years and above (the minimum school-leaving age))[206]
$\eta InvBF_K$	=	net investment of durable fixed (business) capital (i.e. producer goods) ($\dot{\eta}BF_K = \Delta\acute{r}_{*}\eta BF_K - \acute{r}\%\Delta LaborForce_{*}\acute{r}\eta BF_{K(t-1)}$)
ηInt	=	net international position

Psychic Disservices (dš)

CDE	=	consumer durable expenditures
*P*AuAccD̆	=	auto accidents (private defensive expenditures) (number of accidents per registered vehicle*the cost per vehicle accident)[207]
PCm_t	=	private commuting (direct, out-of-pocket costs)
*P*heedD̆	=	defensive expenditures on private health and education outlays (50% for both)
*P*CrD̆	=	defensive expenditures on crime prevention (private level) (theft of privately owned property, and the cost of being confined indoors at particular times of the day or to particular places—assumed equivalent to the amount spent by all forms of government on public order and safety)
FamBr	=	family breakdown by the cost of divorce and its effects on children (expenses for legal fees, counselling, establishing separate residences—the total number of divorces*total number of children affected by these divorces), and the amount of time families spend watching television
Ue_t	=	unemployment (number of unemployed persons seeking either full-time or part-time work*the average real hourly wage)
Ude_t	=	underemployment (total number of underemployed hours*real hourly cost)
*P*PollD̆	=	defensive expenditures on household pollution abatement
NoiPoll	=	noise pollution (via a constructed noise pollution index)
AirPoll	=	air pollution, impact on urban property values and wages, and urban aesthetics, assumed to constitute 40% of the total cost of air pollution (control and damage costs)

Depletion of Ecological Capital (δE_K) **=** ***Uncancelled Costs***

AirPoll	=	air pollution, loss of the ecosphere's sink function, assumed that 60% of the total cost of air pollution reflects the waste assimilative capacity of the natural environment having been exceeded (damage to agricultural vegetation, materials damage, control costs of cleaning soiled goods, acid rain damage to forests and aquatic ecosystems)
WatPoll	=	urban water pollution via a constructed water pollution index (control and damage costs)
WasPoll	=	municipal solid waste pollution (function of the quantity of waste added to landfill sites)
Mine	=	mineral resources (user (depletion) cost of metallic and non-metallic mineral stocks)
Ener	=	energy resources (user (depletion) cost of coal, oil and gas stocks)
Timb	=	timber resources via user cost, when the rate of timber stocks harvested exceeds the natural regeneration rate (separate values attached to native forest timber, woodland forest timber, plantation timber-broadleaved, and plantation timber-coniferous)
Fish	=	fishery resources via user cost, when the rate of fishery stocks harvested exceeds the natural regeneration rate (prawns, rock lobster, abalone, scallops, oysters, fish (excluding tuna), tuna)

[206] The average weekly hours of nonleisure include the following: paid employment; unpaid work; commuting; resting and sleeping; getting an education; and job seeking.

[207] According to Lawn and Sanders (1999:221), the *private* costs of the damage of vehicles are measured (and not the costs from the 'business sector').

Ozone	=	ozone (cumulative production of CFCs-11,12)
NatHab	=	natural habitats/areas (separate values attached to the hectares lost or degraded wetlands, mangroves, and saltmarshes—cumulative loss)
Land	=	agricultural land (annual productivity loss equal to 6% of the annual value of agricultural production, and the losses due to urbanisation—cumulative losses)
Futur	=	long-term (future) environmental damage (annual consumption of energy converted to a crude oil barrel equivalent—cumulative figure is equivalent to the amount needed to compensate future generations for the excessive use of energy resources)
EHI	=	Ecosystem Health Index (adjustment) (lost life-support functions, landcover disturbance surveys)

The EHI is applied to the whole 'uncancelled cost' account. A high level of intricacy is evident in Eq. (5.36) above, encapsulating thirty-three unique parameters. Overall, Australian SNBI is very good contribution to the literature.

5.6.2 Australian Fisherian Income (YF) – Lawn (2004b, 2006c)

Fisherian income (YF) is concerned with sustaining productive capacity and the net psychic income enjoyed by a nation's citizens. The need for a 'Fisherian income indicator' was recognised by Lawn (2004, 2006d). The author assumes that 20 percent of all private and public consumption expenditure constitutes spending of a defensive and/or rehabilitative kind. As such, 80 percent of private and public consumption expenditure is enhancing welfare. This is a conservative adjustment when compared to similar studies. In order to calculate the 'net psychic income', the following technique is utilised: the services from personal consumption expenditures ($\hat{s}PCE$), stock of consumer durables ($\hat{s}CD_K$), and non-defensive public expenditures ($\hat{s}GE$) were added together after subtracting consumer durable expenditures (CDE); these four items were then adjusted by a distribution index (DI). Then the depreciation flow of durable fixed business capital (δBF_K) was added.[208] The way the YF indicator is constructed is special but it is similar to the basic ISEW/GPI templates. Hence, according to the grading system, the above six 'net psychic income' variables are counted as minor contributions.

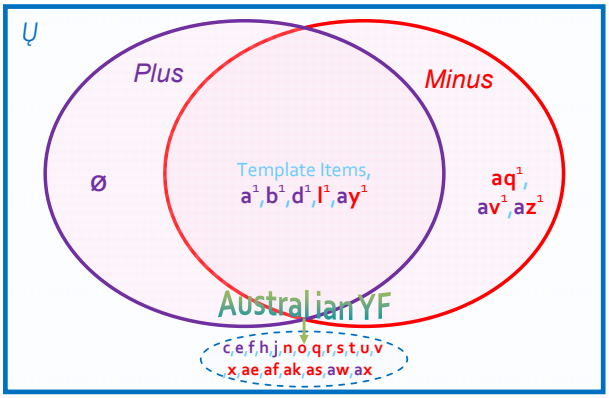
Lawn (2004, 2006d) avoids over-complicating the calculation of the 'psychic outgo' and the 'depletion of ecological capital' components. To make things simpler, he omits numerous psychic costs of economic activity, items such as the positive value of volunteer and household labour, leisure time, the costs of unemployment, noise pollution, commuting, crime, and family breakdown, and the change in a nation's foreign debt position. Of the ecological parameters included, virtually all are transposed from the Hamilton and Dennis (2001) study, such as the costs of the loss of old growth forests, ozone depletion and long-term (future) environmental damage. Measuring the costs of 'excessive irrigation water use' and incorporating an 'Ecosystem Health Index

[208] Note that the 'δBF_K' variable is not new. Nordhaus and Tobin (1971) subtracted a depreciation flow of business capital in their adjusted NNP indicator.

(adjustment)' are supplementary items of the basic template design. But these items, 'δIrrigEK' and 'EHI', are reiterations of a former study. Thus, they are counted as minor advances.

The technical advances of the Australian YF over the US ISEW/GPI (1) template are illustrated in *Figure 5.33* below:

Figure 5.33. Technical Advances of the Australian YF over the US ISEW/GPI (1)



KEY:
Ụ = Universal Set
Template US ISEW/GPI (1) = *Plus* ∩ *Minus*
Australian YF = *Plus* ∪ *Minus*

Degree of technical contribution:
¹ = minor, ² = major

Omissions = *Australian YF*^{C}
The dashed circle delineating element(s) in *Ụ* illustrates excluded variables from the original template

Template US ISEW/GPI (1) = {a,...c,e,f,h,j,l,n,o,q,...v,x,ae,...ah,ak, al,ao,ar,...au,aw,...ay}

Key modifications to the existing *Template Items* = {a,b,d,l,ay}
- a = {š*P*CE | Services from personal consumption expenditures}
- b = {šCD$_K$ | Services from the stock of consumer durables}
- d = {š*G*E | Services of non-defensive public expenditures}
- l = {CDE | Consumer durable expenditures}
- ay = {DI | Distribution index (adjustment)}

Excluded items from the basic template = *Australian YF*^{C} = {c,e,f,h,j,n,o,q,...v,x,ae,af,ak,as,aw,ax}
- c = {š*G*F$_K$ | Services from durable fixed public capital}
- e = {š*G*heedE | Services of non-defensive public expenditures in health and education}
- f = {šHh$_t$ | Services of household labour}
- h = {šVol$_t$ | Services of volunteer labour}
- j = {šHhFam$_t$ | Services of household work and parenting}
- n = {dš*P*Urban | Disservices of the disamenities of urbanization (private level)}
- o = {dš*P*AuAccĎ | Disservices of auto accidents (private defensive expenditures)}
- q = {dš*P*Cm$_t$ | Disservices of private commuting}
- r = {dš*P*heedĎ | Disservices of defensive expenditures on private health and education outlays}
- s = {dš*P*CrĎ | Disservices of defensive expenditures on crime prevention (private level)}
- t = {dšAd | Disservices of advertising}
- u = {dšFamBr | Disservices of family breakdown}
- v = {dšLeis$_t$ | Disservices of lost leisure time}
- x = {dšUde$_t$ | Disservices of underemployment}
- ae = {dš*P*PollĎ | Disservices of defensive expenditures on household pollution abatement}
- af = {dšNoiPoll | Disservices of noise pollution}
- ak = {δMineE$_K$ | Depletion of mineral resources}
- as = {δNatHabE$_K$ | Loss of natural habitats}
- aw = {ŋInv*PBG*F$_K$ | Net investment of durable fixed (private, business and government) capital}
- ax = {ŋInt | Net international position}

Extension of the benefit items = *Plus* \ *Minus* = {Ø}
Extension of the cost items = *Minus* \ *Plus* = {aq,av,az}
- aq = {δIrrigE$_K$ | Costs of excessive irrigation water use}
- av = {δ*B*F$_K$ | Depreciation flow of durable fixed business capital}
- az = {EHI | Ecosystem Health Index (adjustment)}

As previously mentioned and seen in the figure below, a large number of variables were excluded in the YF, twenty items in total. Three variables are extensions of the cost items, including the variable, 'depreciation flow

of durable fixed business capital' (δBF_K). Overall, there are eight contributions (8 minor, 0 major) in the Australian Fisherian Income indicator.

The Lawn's YF puts forward a slightly different identity to the prevailing US ISEW/GPI (1) template, as shown in Eq. (5.37) below:

$$YF = (0.8*(\hat{s}PCE + \hat{s}GE - CDE + \hat{s}CD_K))/DI*100 + \delta BF_K - (\mathbf{\delta E_K}[AirPoll + WatPoll + Ener + Ozone + Irrig + Forest + Land + Futur])/EHI*100 \quad (5.37)$$

Net Psychic Income ($\eta\rho\hat{y}$)

$\hat{s}PCE$	=	personal consumption expenditures
$\hat{s}GE$	=	non-defensive public expenditures
CDE	=	consumer durable expenditures
$\hat{s}CD_K$	=	the stock of consumer durables (10% annual depreciation flow)
DI	=	index of distributional inequality (Gini)
δBF_K	=	durable fixed business capital ('consumption' of previously accumulated human-made capital)

Depletion of Ecological Capital (δE_K)

AirPoll	=	air pollution (damage to humans and environment from noxious emissions via health costs)
WatPoll	=	urban water pollution (damage to ecology via the control cost of improving water quality, i.e. estimating the environmental costs associated with waste water treatment and disposal)
Ener	=	energy resources (costs of shifting from petroleum and natural gas to renewables)
Ozone	=	ozone (annual emissions valued by future impacts on humans and environment) (enhanced UV-B radiation damage to human health and to terrestrial and aquatic plants, where the costs are directly related to the annual emissions of consumption of CFCs)
Irrig	=	excessive irrigation water use (estimating the loss in agricultural output from reductions in water diverted to irrigation, measured by the opportunity cost of environmental flows)
Forest	=	old growth forests (environmental values denied to future generations measured by the WTP)
Land	=	agricultural land (costs to current and future generations from soil erosion, acid soils and salinity measured by forgone output)
Futur	=	long-term (future) environmental damage (annual emissions of CO_2, NO_x and methane valued by future impacts on humans and environment—estimated contribution of each tonne of emissions to the damage it is expected to cause in the future)
EHI	=	Ecosystem Health Index (adjustment) (lost life-support functions, landcover disturbance surveys)

Despite the strength of a theoretical foundation, amid the zero innovations of the Australian YF over the US ISEW/GPI (1) templates, the *technical* contribution to the literature is minimal at best.

5.7 The Effective Rate of Replication (EROR) – Are There Major Limits to Redeveloping the ISEW/GPI?

This section now summarises the results from the technical survey detailed in *Sections 5.4, 5.5 and 5.6*. It was hypothesised at the beginning of the chapter that *net income indices are innovative measures of welfare and capable of improvement*. In this study, the validity of hypothesis four (H4) is partly determined by the extent of innovatory techniques employed by the authors of net income indices. For assessing hypothesis four, H4, we are especially interested in the ISEWs, GPIs, SNBI, and YF *as a collective body*. If the evidence suggests that innovations are manifold then there is less chance that the basic templates of ISEW/GPI have been replicated. On the other hand, if the evidence suggests that innovations are shallow then the basic templates of ISEW/GPI have probably been

imitated. An appropriate scale is therefore devised that incorporates the scores of the 'minor' and 'major' contributions ('1' = minor, '2' = major) as rough proxies for measuring the degree of technical innovations.

The scale is called the 'Effective Rate of Replication' (EROR). The EROR pertains to the degree of replication in relation to the basic template *and to* the prevailing empirical material. Founded on the investigator's simple dual-score rating system, EROR is a weighted summation of these individual scores. The quantities of 'minor contributions' and 'major contributions' are derived from a critical analysis of the literature in the body of this chapter. As specified at the beginning, 'major technical contributions' are effectively "innovations": a score is credited to the author(s) who *first* introduced a *new* variable and/or made a *significant* change in methods. 'Minor technical contributions' are not innovations *per se*: a lesser (minor) score is credited to the author(s) who integrated variables that are *not found in the basic templates* and/or moderately changed the methods that are *found in the basic templates*, applying them to their country/area of interest. When nothing original has been created from the prevailing empirical material, a minor score is awarded because the basic templates, i.e. US ISEW (2) and/or US GPI (1), are the reference points of our investigation.

Hence, in order to capture the degree of innovations, it is assumed that for each study (i) of a set of thirty-three studies, a 'major contribution' (M_i) is worth four times more than a 'minor contribution' (m_i). This weighting scheme is arbitrary, in much the same way as those employed in the literature on net income indicators.[209] There are twenty-one variables utilised in the original US ISEW (2), which is the primary basic template used in this study. With the number, '21', and knowledge about the number of major (M_i) and minor (m_i) contributions an EROR can be calculated. EROR gives a percentage of 100 percent or less, as shown in Eq. (5.38) below:

$$\text{EROR} = 100 - (\sum_i (0.2 * m_i + 0.8 * M_i)/21) * 100 \qquad (5.38)$$

Where a score of:

90 ≤ 100	=	Imitated: Virtual Replication
60 < 90	=	Modified: Good Refinements
30 < 60	=	Innovatory: Highly Reformulated
< 30	=	Radical: Model Questioned

Any EROR score of 90 and above, up to and including 100 means that the authors have virtually replicated the basic templates of the ISEW/GPI. An EROR score between 60 and 90 suggests that there have been good

[209] For instance, in his Fisherian income study, Lawn (2004b, 2006c) adopts the following arbitrary assumption: that 80% of consumption expenditures are positively contributing to well-being and the remaining 20% are not.

refinements made to the basic templates of ISEW/GPI, albeit it depends on where the final value falls, i.e. close to the upper or lower echelon of the scale. An EROR score between 30 and 60 implies that authors of SEWIs have employed a great deal of innovatory practices; the structure of ISEW/GPI is highly reformulated. Any EROR score less than 30 would entail a radically different ISEW/GPI model, perhaps a completely new measure. EROR is thus a useful proxy for determining whether the 'Net Income Indices' are innovative measures and capable of improvement (H4). The overall results of the dual-score rating system and EROR for the set of thirty-three studies are shown in *Table 5.2* below:

Table 5.2. EROR Analysis of the Technical Contributions of Net Income Indices

ISEWs, GPIs, SNBI, YF (Assessed Chronologically)	**Country/ Region(s)**	Minor Contributions (qty)	Major Contributions (qty)	***Effective Rate Of Replication (EROR)* (%)**
Indexes of Sustainable Economic Welfare				
Diefenbacher (1994)	Germany	1	0	99
Jackson and Marks (1994)	UK	3	3	86
Jackson *et al.* (1997)				
Moffatt and Wilson (1994)	Scotland	3	1	93
Rosenberg *et al.* (1995)	Netherlands	1	2	91
Jackson and Stymne (1996)	Sweden	3	1	93
Stockhammer *et al.* (1997)	Austria	6	4	79
Guenno and Tiezzi (1998)	Italy	3	1	93
Castañeda (1999)	Chile	2	0	98
Gil and Sleszynski (2003)	Poland	2	0	98
Prochowicz and Sleszynski (2006)				
Clarke and Islam (2004, 2005a), Clarke (2006b)	Thailand	7	3	82
Pulselli *et al.* (2006)	Siena (Italy)	3	1	93
Jackson *et al.* (2006)	Yorkshire and Humber, Northern Way, UK	9	2	84
Bleys (2006a, 2006b)	Belgium	6	2	87
Bleys (2008)				
Bleys (2007a, 2007b)	Netherlands	4	0	96
Genuine Progress Indicators				
Cobb *et al.* (1995)	US	1	6	76
Anielski and Rowe (1999)		1	0	99
Cobb *et al.* (1999)				
Cobb *et al.* (2000)				
Cobb *et al.* (2001)				
Venetoulis and Cobb (2004)				
Talberth *et al.* (2007)		3	3	86
Hamilton (1997, 1999)	Australia	9	7	65
Hamilton and Denniss (2001)		17	2	76
Anielski (2001)	Alberta	14	6	64
Costanza *et al.* (2004)	Vermont, Chittenden County and Burlington (US)	2	0	98
Clarke and Lawn (2005) Lawn and Clarke (2006a, 2006b)	Victoria (Australia)	9	2	84
Lawn and Clarke (2006b), Clarke and Lawn (2007)	Australia			
Wen *et al.* (2007)	Suzhou, Yangzhou, Ningbo, and Guangzhou (China)	3	2	90
Sustainable Net Benefits Index (SNBI)				
Lawn and Sanders (1999), Lawn (2001)	Australia	3	7	70
Fisherian Income (YF)				
Lawn (2004b, 2006c)	Australia	8	0	92
TOTAL: (Unweighted Average)	Set of Thirty-three Studies (Twenty-five grouped works)	**5**	**2**	**87%**

The above table indicates that the majority of authors have imitated the basic template of the ISEW. On the other hand, the GPI is an important attempt to 'socialise' the ISEW. The authors of the original GPI achieved good technical refinements in the methods used since the rebirth of ISEW; with an EROR of 76%, they have made some satisfactory refinements. However, the GPI is virtually analogous in "theory" to that of the original ISEW, and largely impersonates it. Therefore, as exemplified by the EROR of 87% for the set of thirty-three studies, authors of the net income indices have for the most part impersonated the basic template design of the ISEW. This is not a problem *if* the basic template features a solid conceptual base—which *Chapter 3* argued is not the case.

Hence, with respect to hypothesis four (H4), net income indices are not very innovative measures of welfare. As a collective body, the extent of innovatory techniques employed by the authors of net income indices is low. The high replication rate may indicate that there are major limits to radically (re)developing the ISEW/GPI—i.e. it has not been possible for advocates to attain a 'Highly Reformulated', low EROR score between 30 and 60 (see *Table 5.2*). For example, inclusions of the obsolescence of consumer goods and social interdependence were noted by some authors at an early stage of the research material, yet they were not developed in any of the net income indicators. What other elements could have been included (or excluded)? Most importantly for this study, what is the relationship between the ISEW/GPI (and its derivatives) and the disembedded economy? The answer to such crucial questions warrants a final critical analysis into these net income indices.

5.8 Conclusion

In summary, this study has critically evaluated the authors' relative degree of technical contribution vis-à-vis the basic templates of the US ISEW (2) by Cobb and Cobb (1994) and the US GPI (1) by Cobb *et al.* (1995), *and* the prevailing empirical material. With the aid of Venn diagrams, set theory notation and detailed equations, a scrutiny of the minor and major advances of the net income studies were presented. There are some very good contributions to the literature, such as the Austrian ISEW by Stockhammer *et al.* (1997), Albertan GPI by Anielski (2001), Australian GPIs by Hamilton (1997, 1999) and Hamilton and Denniss (2001), and the SNBI by Lawn and Sanders (1999) and Lawn (2001). These studies were innovatory because of new extensions of variables and/or considerable changes in technical methods. However, relatively speaking, the majority of studies have not excelled in this area.

Many studies slavishly follow the technical methods adopted by Cobb and Cobb (1994) and Cobb *et al.* (1995). They substitute most of the variables of the US ISEW (2) or the US GPI (1) for their region/area of

interest. In the main, they merely mimicked their predecessors and in most cases copied the prevailing commonsensical accounting template without adequate critical analysis of, or improving upon earlier works. The high replication rate may indicate that there are inherent limits to redeveloping the ISEW/GPI. In other words, SEWI advocates appear to be stuck with a restricted set of variables to conduct their analyses of social and environmental welfare. H4 is thus rejected. In the next chapter, a fundamental critique of the net income indicators is put forward, arguing that an alternative measure anchored in the political economy of the disembedded system is a (partial) solution to the research problem. It is argued in the final major chapter of this study that the SEWIs desperately need radical theoretical reconstruction or else abandon the project altogether.

Chapter 6.
A Fundamental Critique of Net Welfare Indicators

6.1 Introduction

Chapter 5 examined the advocates' relative degree of technical contribution. Some of these studies are quite innovatory because of their new extensions of variables and considerable changes in mechanical methods, e.g. the GPI is an important attempt to 'socialise' the ISEW. However, many studies slavishly follow the basic templates of Cobb and Cobb (1994) and Cobb *et al.* (1995). They merely imitate their predecessors by substituting the US ISEW or US GPI for a national, subnational or local area of interest. The high replication rate may indicate that there are *limits* to radically (re)developing the ISEW/GPI. This is not a problem *if* the template features a strong conceptual base. A deeper scrutiny of the robustness of conceptual foundations of net welfare indicators is now needed.

Utilising the principles of political economy, this chapter embarks on such an analysis. Phillip O'Hara (2007b) defines political economy as:

> a realistic, interdisciplinary study of the dynamic structure, evolution and transformation of human action within socioeconomic systems, paying particular attention to the reproduction, functions, contradictions, and unstable dynamics of the institutions of production, distribution, and exchange of material and immaterial resources set within a social and ecological environment through historical time. [O'Hara 2007b:6]

For political economy, a strong historico-institutional apparatus is critical for a proper view of the ecological, evolutionary and socio-political dimensions of global and regional dynamics. The promotion of a realistic dialectical analysis is the basis of pragmatic enquiry in political economy.

Hypothesis five, H5, of this study thereby states that:

H5: Understanding the political economy of capitalism will provide vital insights into Net Welfare Indices.

There are major limitations of the approach to sustainable development as construed by ecological economists (the advocates of Net Welfare Indices). They have a tendency to view 'society', 'capital' and 'service' largely autonomous of the disembedded economy. This is a major problem for the Net Welfare Indices. Hence, *without* fundamentally understanding the productive, property, and power relations that define

the system, applications of net income indices are futile (H5).

This chapter develops a fundamental critique of net welfare indicators. Because of an extensive range of indicators in the literature, for specificity, the scope of analysis is delimited. But it is possible that the critique will pertain to the gamut of other net welfare indices. Nonetheless, in this study, the focus is on the following popular net welfare (or net income) indicators: the Index of Sustainable Economic Welfare (ISEW), Genuine Progress Indicator (GPI), Sustainable Net Benefit Index (SNBI) and Fisherian Income (YF). These indicators are similar in many ways; in this study, they are described as "ISEW/GPI/SNBI/YF", Net Welfare Indices, or Sustainable Economic Welfare Indicators (SEWIs). *Chapter 6* is divided into seven major sections to develop a panoptic critique of the measures. We will now summarise each major section, which begins with a synopsis of the nature of the problem, the critique, and the political economy principles utilised to develop the argument.

Section 6.2 centres on the foremost conceptual issue within SEWIs. 'Net psychic income' has been entrenched as the predominant theoretical basis for the aggregated measures of sustainable economic welfare. But is the account of net psychic income realistic and dynamic? We examine this question in more detail in connection with the *multiple capital paradigm* (MCP). The MCP recognises that there are heterogeneous durable structures (capital stocks or wealth) that potentially yield services and disservices. A limited view of wealth leads to major theoretical problems. However, ambiguity is found due to the advocates' oversimplification of Irving Fisher's notion of psychic income experiences and of service flows from capital. It is argued that the indices lack a holistic and strong theoretical foundation because of a limited conceptualisation of wealth, specifically 'human-health capital'.

The MCP principle is also utilised in *Section 6.3* to underscore that the advocates have a limited ontology of 'consumption'. The reference point for measuring economic welfare in the SEWI, i.e. personal consumption expenditures, is probably inadequate because of the weak connection between choice and social welfare in a *disembedded economy*. The disembedded economy features an inclination for economic relationships to dominate social relationships of affiliation and organisation. It is argued that several key concepts of political economy are unheeded in their analyses, specifically, the ignorance of producer v consumer sovereignty. Consumption is not necessarily for 'inner-directed' (satisfaction) purposes, e.g. fashion goods. A consumer's 'free' choice vis-à-vis their net welfare is convoluted because of the uselessness of obsolescence and of conspicuous consumption and emulation. These abstractions from reality further support the argument that the SEWIs have a soft theoretical base.

Section 6.4 represents the backbone of this chapter. Advocates of SEWIs have primarily considered only two forms of capital, artefact (such as consumer goods) and ecological (such as natural resources) capitals. Regrettably, they have tarnished other critical forms of wealth, namely, human-health capital *and* social capital by superficially counting these forms of wealth in their net welfare indicators. Subsequently, it is argued that their conception of capital is simplistic. Their restricted view of social capital inhibits the conceptual and empirical analysis. It leads potentially to the destruction of vital forms of wealth because they are abstracted from the analysis. But, the greatest fault by advocates is the lack of connecting their view of wealth with the principle of '*multiple contradictions of the disembedded economy*'. It becomes evident that advocates have not properly understood the concept of contradiction, which entails scrutinising the positive and negative features of socioeconomic systems that are endogenously ingrained in the fabric of various processes, institutions and relationships.

The advocates of SEWIs focus mainly on the contradiction between the natural environment and consumption goods. They are obsessed with the natural environment; yet only handle society to a limited degree. They are in a *one-and-a-half contradiction world*; they see primarily *one* contradiction and a *partial* social reality. Yet, in the global disembedded economy, all areas of life are both relatively autonomous yet interconnected. The creation of markets and new products often occur through the destruction of non-market relations. Consequently, the so-called 'service' from consumption in the SEWIs is not genuine, because culture and tradition are potentially being destroyed in the process. It is necessary to transcend the 'one-and-a-half contradiction world' and have a broader view of wealth. The root of the problem is that the vast majority of net income studies concentrated on accounting techniques, rather than solving these vital theoretical concerns.

The reference point of 'consumption' in SEWIs is not only a problem in itself but also one of misplaced concreteness of monetary imputations, as argued in *Section 6.5*. Monetary measures ignore important personal, social and cultural perceptions. Sometimes the actual flow of the disservice is not known with certainty, because of *imperfect information*. Many people are not fully informed about the health implications of a whole range of 'goods'. Thus, the validity of the link between price, money, value and the psychic services/disservices is challenged. There is imperfect knowledge not only about ecological systems, but also about unexplained phenomena and uncertainty in all forms and aspects of life processes. It is impossible to infer an 'optimal value' of net welfare purely in monetary terms. There must be a rejection of theory based on optimality. Questions are thus raised about the competence of SEWIs to deal with real-world problems in an

environment of uncertainty and lack of information.

Thus, it is not very meaningful to construct indicators where 'price' is the leading measure of welfare. More importantly, as *Section 6.6* argues, solitary restriction to 'price' in the SEWIs (subjugated by consumption) buttresses the doctrine of the disembedded economy, because there is *no social sustainability basis*. Non-market relationships and social relations of power are abstracted in such studies—in part the ideology of disembeddedness is now manifested within the framework of SEWIs. The process of constructing an aggregated net-consumption index without scrutinising the monetary evaluations in the context of a dynamic capitalist system downplays societal processes. There is an indeterminate and qualitative character of service/psychic-income and disservice/psychic-outgo generation from wealth. It is impracticable to scrutinise the dynamic processes of a capitalist society in a single index.

Section 6.7 argues that we cannot consider the sum of incomes (services) flowing from commodities as the most important quality. Foremost, we must decipher under what conditions *who* receives the service, because of moral or institutional constraints. That is, one cannot simply consider the service flowing from a commodity without interpreting distributional aspects. For instance, there is a potential trade-off between individual and social welfare, where the interests of the individual are satisfied at the expense of societal welfare. Utilising the *holistic method*, the role (if any) of the individual and the social entity in the net psychic income index (by advocates) is critically assessed in this section. There are more complications with SEWIs, especially when the relationship between the global political economy and individual welfare is complex. Complexity prevails because social structures and dominant institutions shape the social filters, which include attitudes, beliefs, judgements, values, habits, and behaviours.

It is argued in *Section 6.8* that SEWIs prevent fruitful net welfare analysis of *heterogeneous agents*. The principle of heterogeneous agents states that there are multiple positions and diverse roles in which individuals and species function in the economy. For example, the ability of parents to influence the intergenerational transfer of resources to their offspring (children) is a crucial determinant of the material and cultural advantages they will bring to bear on the future. High levels of education among the community and key job and economic connections (social linkages) are common for people from families with more control of wealth. Merely summating the income of individuals in an index would therefore trivialise important asymmetric *distributional problems in the market economy*. They have a distributional element *but* it is too general to provide an instructive analysis.

Therefore, it is doubtful that SEWIs are describing and measuring accurately social and ecological change, because significant conceptual,

methodological, and technical inconsistencies mar the results. The *raw* ecological economistic approach limits the study. There is a need to transcend it. As a point of departure, it is best to have a global social *and* ecological political economy approach. *Section 6.9* concludes the chapter by summarising the critical appraisal of the outlook for SEWIs. Direction for this study is discussed: the need for a radical theoretical reconstruction ingrained in strong socio-institutional analysis. Succinctly, the fundamental critique of SEWIs from a political economy viewpoint has significance, because numerous flaws and vital oversights have surprisingly been overlooked in the net welfare/income literature.

6.2 Is the Account of Net Psychic Income Realistic and Dynamic?

According to Philip A. Lawn, SEWIs are pecuniary measures of the "welfare a nation enjoys at a *particular point in time* given the impact of past and present activities" (Lawn 2003:106, 2005:187-8). That is, the SEWI for a particular year is an estimation of the economic welfare being experienced by a nation's citizens in that year. Lawn (2004b, 2006c) argues that the monetary measures are based on Irving Fisher's (1906) definition of "net psychic income". He details each price-based item within the ISEW, GPI, SNBI and YF and links it to the Fisherian concept of income and capital. He evaluates some criticisms raised against the indicators and thus puts Fisher's notion of income embedded in a 'sustainable development' framework into perspective (see Lawn 2001, 2006a). For example, he has integrated, rather well, 'service' and 'disservice' into the sustainable development paradigm (see Lawn and Sanders 1999:215-6). Quintessentially, Lawn argues that SEWIs in principle provide a first-rate income statement of the *ability to achieve* sustainable economic welfare when depleting the source, sink, and life-support services provided by ecological capital.

Lawn's 'ecologising' of Irving Fisher's concept of income and capital is an outstanding contribution to the literature. Particularly, he has justified the applicability of the Fisherian worldview in accounting for loss of natural capital services as a consequence of the accumulation of final artefact, durable fixed business and public capital services. One concludes after a critical examination of his works that Lawn has undertaken an 'entry point' into the complex wealth–welfare equation. Hence, the *single contradiction* he implicitly identifies is the loss of ecological capital and the accumulation of 'human-made capital'. The contradiction of 'environmental protection and durable fixed business capital' is a critical problem, as the public goods of a clean environment and climate stability have deteriorated in the pro-market economy. The contradictory nature of capitalism results in high social costs, mass environmental waste and biodiversity loss, which reduce sustainable

economic welfare (Brennan 2004, Muir and Zegarac 2001).

However, SEWIs are *partial* measures of sustainability.[210] For instance, only a portion of the total resource costs associated with natural resource depletion is deducted. Empirically, the focus of SEWIs is on maintaining non-declining welfare itself (services) in the present.[211] Maintaining the capacity to provide non-declining welfare in the future (embodied in capital) is apparently *not* the focus point of SEWIs. Dietz and Neumayer (2007) argue that by assuming the diverse components of comprehensive utility can be simply added together in arriving at an overall indicator, they are a measure of weak-sustainability, not strong-sustainability. "The underlying assumption is that an increase in one component can compensate for a decrease in another" (Dietz and Neumayer 2007:621). Yet, as argued in *Chapter 3*, the theoretical foundations of SEWIs are *in principle* based on strong-sustainability (vis-à-vis the contradiction of ecological and human-made capital).

The idea of 'strong sustainability' requires us to acknowledge the trade-offs (if any) in other forms of capital.[212] With strong sustainability, reversibility is not possible when certain critical stocks of ecological capital are destroyed. In terms of the *multiple capital paradigm* (MCP), there are various forms of durable structures such as private business, public, final artefact, ecological, human and social capitals (see O'Hara 2001a). These categories are heterogeneous and not easily reduced to a common measure of value, e.g. human capital is mainly dependent upon social, cultural and organisational capital. In essence, the many forms of capital are a "stock of durable structures" (be they machines, knowledge, norms, trust, relationships, or organisations), which have a flow of services (potentially at least) over time. Capital stocks can provide services in many ways, such as providing friendship, relations of marriage, knowledge, skills, organisational solutions, trust, or beauty. Investment therefore takes many forms, namely, being the build-up of such specific durable structures through time. Consumption of capitals *is* destruction when the market-system destroys specific capitals in order to create "services". With respect to hypothesis five (H5), the MCP is crucial

[210] "The ISEW ... attempt[s] to account for future sustainability by incorporating measures of the economic impacts of resource depletion, and the long-term impacts of environmental damage. ... [But,] ISEW should be regarded only as a *de minimus* indicator of sustainability or unsustainability of past actions, and not as any kind of insurance policy against the future" (Jackson and Marks 1994:35).

[211] For example, in the case of ozone depletion, long-term environmental damage, and lost old-growth forests, the impact on the sustainable economic welfare in a given year depends primarily on what has happened in the past. The total monetary cost in any given year reflects the amount required to compensate a nation's citizens in that year—in a sense, a compensatory fund—for the cumulative impact on the ozone layer, climate change and old-growth forests of past as well as present economic activities.

[212] In general, sustainability of a global or local system can be understood as the compatibility among social, economic, and cultural dynamics and environmental resources in the present and the future (Pol 1996:28, Uzzell *et al.* 2002).

for a realistic study of the dynamic material and immaterial durable structures and transformations of human welfare.

But is the account of net psychic income realistic and dynamic? How are the advocates trying to comprehend the underlying processes at work in the structures of capital/service? What is the corollary of Lawn's entry point into the complex wealth–welfare equation? A limited view of wealth leads to serious theoretical questions. It is not that Fisher's concept of psychic income or psychic service should be entirely discarded, but a scrutiny of the multifaceted nature of psychic income is required. For instance, Lawn states, "one of the key implications of the Fisherian concept of income and capital is that additions to the stock of human-made capital should not be counted as income" (see Lawn 2005:201).[213] However, because of the limited worldview of 'wealth', the following important question remains unanswered: Does not a major part of the processing of 'psychic flux' modify the stock of "*human-health capital*" over real historical time? This question centres on the human psyche, which will be examined systematically below, following a short review of psychic income/service.[214]

Closer analysis of Kenneth Boulding's "A Reconstruction of Economics" (1950) reveals important information regarding the analysis of the durability of capital stocks and the important link to psychic income. According to Boulding (1950:139-41), it can be doubted that any non-durable goods exist when one considers psychic capital. Even services, for example movies, engender psychic capital with a limited rate of depreciation. As moviegoers, people go to produce a mental state. One purchases this mental state (a commodity) with the admission prices. This commodity depreciates like any other commodity. There is rapid depreciation for some people, so that it has to be replaced in a week or less. For other people the rate of depreciation is slower and so

[213] According to Lawn, investment-demand that renders (potential) services in future years is not part of the current flow of income. This is because the current flow of 'income' is based on the investment-demand undertaken in the past. For instance, the SNBI ensures that additions to the stock of human-made capital should not be counted as income by subtracting *current* expenditure on consumer durables and by not adding *current* government expenditure on human-made capital.

[214] Lawn (2001:3) following Georgescu-Roegen (1971) agrees that human welfare depends, not on the rate of a physical flow, but on a *psychic flux*—the psychic enjoyment of life. "[T]he service yielded by the stock is a 'psychic flux' and, with no physical dimension of its own, cannot be accumulated (Daly 1979:[80])" (Lawn 2001:79). According to Lawn, a *flux* rather than a stock or flow is a 'service' that closely corresponds to Fisher's (1906) notion of *psychic income*. That is, the psychic flux cannot be experienced *per se* without the existence of physical goods (and labour)—the intensity with which physical commodities are able to service humankind's 'ultimate end' depends on their individual service-yielding qualities. The psychic enjoyment of life is determined primarily by the quantity of the stock of human-made capital (at least up to a certain amount), the quality of the stock, and its ownership distribution (Lawn 2006b:37). Surprisingly, in all of Lawn's works, at least up to the time of writing (April 2009), he neither defines with specificity nor critically evaluates the concept of 'psychic *flux*', even supposing it is paramount in the SEWI's theoretical framework. Besides, Lawn (2003) develops Fisher's notion of 'psychic income' in SEWIs—not the so-called 'psychic flux'. For the purposes of this critique, the 'psychic flux' is directly interpreted as meaning Fisher's notion of *psychic income*, the psychic enjoyment of life.

they do not go to another movie for a month or even less frequently. Applying Boulding's analysis to Fisher's capital and income framework, welfare is enhanced not by a direct increase in money income or output, but from the durable capital stock, which eventually equates to psychic income. Therefore, if the capital stock is less durable, the satisfactions derived from 'consumer goods' (i.e. final artefact capital) are short lived. That is, the intensity of the service derived depreciates rapidly over a period of time. Boulding argues for a more durable form of capital that sustains long-lasting satisfactions, because the true measure of economic well-being is derived from the enjoyment of the capital stock.

Critically, however, Boulding recognises the *inseparability* between well-being and net psychic income attainment. The following passage from "What is Economic Progress?" illustrates the case:

> The satisfaction [that] we received from our houses, our furniture, and our clothing for instance is derived from their use not from their consumption. It is really [a misfortune or system-function] that houses depreciate, that furniture wears out, and clothing becomes shabby. The same principle actually applies to all items of consumption, even those we usually think of [as] services. We eat lunch because breakfast has depreciated. We go to a concert because the psychic capital produced in [the] mind by the last concert has faded. *Well-being in this view is regarded as a state of the human organism, a state [that] continually depreciates and has to be restored. It is a state also which we hope in some sense can grow or improve. ... The more corruptible is human well-being* and the less durable the material things with which that well-being is defended the more production we will have to have. In this view it would seem that the less consumption is necessary in order to maintain a given state of well-being the better, and therefore, also, the less production the better. [Boulding 1961:149, emphases added]

Lawn identifies only partially with Boulding's (1961) analysis. The dynamic and complex interactions between stocks, funds, flows and psychic income are undetected by Lawn: the human psyche is capable of experiencing 'growth'.[215] An individual's mind (e.g. their memory or

[215] A *flow* may result either from the decumulation of a *stock* or from the transformation made by the production process. (A flow is a stock spread out over a time interval.) A *fund* provides its services in several processes that occur over time; it cannot be decumulated in an instant (i.e. the total service of a commodity is not used immediately). According to Georgescu-Roegen's (1965, 1969) understanding of commodity production, fund elements represent the 'unchangeable agents' that transform inflows into the outflows. The same commodity may be a flow in one

knowledge), health, or soul is capable of experiencing radical transformation (e.g. relapsing or maturing) over historical time. Knowledge, for instance, accumulates over time, spreads from generation to generation, and spreads across the world.[216] Especially from a long-term perspective, according to Brian Lin (2006:328) "knowledge is a special type of international public good ... [and] the knowledge fund has grown and modern people have consequently been endowed with greater intellectual capacity and capital". In other words, each human generation potentially enjoys the benefits of knowledge transmitted from preceding human generations. Thus, psychic income and outgo experienced are *inextricably linked* with the state of the human mind, body and soul—the condition of a person's well-*being*.[217] Fisher would probably agree because he had a zeal for a healthy constitution.

Fisher was not exclusively interested in physical phenomena, unlike, he believed, most economists (see Barber 1997:vol.2,204). Fisher was highly judgemental of those people chasing luxurious and enervating devices usually connoted by "wealth" at the expense of their health. Concentrating on 'superficial objective phenomena' circumvents truly capturing the quality-of-life. Accounting for so-called objective phenomena leaves out a significant part of the growth and development equation, especially the *condition of human health and disease*:

> A large part of our subjective income is due to our conditions of health or disease. A man [or woman] with a good constitution has a more agreeable stream of consciousness, or subjective income, than one without. The pains and sufferings of illness here find a place in the complete accounts of income and outgo. ... [But] *a healthy body is absolutely essential for receiving and enjoying the income from external wealth*. ... [T]he most essential element of all [is] the vigor of human life. The true "wealth of nations" *is the health of its individuals*. [Fisher 1906:176, emphases added]

Therefore, a person's health was probably the most important constituent to Fisher. Fisher's courageous victorious spell with

process and a fund in another. The mental and physical capabilities of human beings are probably characterised as a 'fund' (less so than a 'stock'), but it is argued as social beings they are, to a degree, *changeable* (or mouldable) agents.

[216] Austrian economists, for instance, recognise that the economic problem of society centres on an understanding of the *limited* knowledge of heterogeneous individuals (e.g. Hayek 1945:519-20).

[217] The problem is even more complex when we realise that human capital formation is inextricably linked to *sustainable* well-being. For example, Lin (2007) argues that achieving global sustainability is possible but it *must* entail an equitable distribution of knowledge capital, i.e. a relatively embedded form of capitalism is (at least) the critical thing for a real increase in sustainable economic welfare.

tuberculosis left him with a passionate lifelong personal and intellectual interest in hygiene (Nordhaus 2005, Tobin 2005a). He believed that a healthy body is vital for enjoying *and* receiving the income from external wealth—modern hygiene, exercise, sanitation, diet, and preventative medicine are essential to enable a greater enjoyment of daily living and working. Hence, the durability of a healthy human life, particularly genetically, was most elementary (e.g. see Fisher 1906:176, 1976).

A good *stock of internal wealth* (i.e. a good state of health) is paramount for agents receiving their 'psychic income'. Remember, according to Fisher, *capital* (or wealth) embraces all stocks of material objects that yield services that human beings like. A literal interpretation of *The Nature of Capital and Income* suggests that he denied the existence of 'intangible assets' or 'immaterial wealth' under his definition of "capital" (see Fisher 1906:39). But as shown by James Tobin (2005a), under the stock of capital, Fisher would include,

> land and other natural resources as well as reproducible goods; objects owned by households and governments as well as by businesses; houses and other consumer durable goods as well as producers' durables; objects whose yields are always in kind, like houses occupied by their owners, as well as those whose yields are marketed for cash; *the bodies of human beings—perhaps their minds too—as well as nonhuman objects*. [Tobin 2005a:211, emphasis added]

However, "[w]hile Fisher thought and cared deeply about index numbers, measurement of income, utility theory, and health, he never connected these different concepts" (Nordhaus 2005:368). Therefore, what type of indicator would Irving Fisher probably have developed? Naturally, to Fisher, a person's constitution partly meant a high-quality psychic income, because when the service (income) or disservice (outgo) enters the stream of consciousness it is termed 'psychic'; hence psychic income and psychic outgo. The services flowing from improved health capital and infrastructure (such as larger investments in health education or improvements in emergency response services) as well as the disservices, such as defensive and rehabilitative expenditures, would be the critical flows to identify in Fisher's well-being indicator. Principally, but incompletely, SEWIs account for some of these types of health services and disservices that flow from the stocks of external wealth (from final artefact, durable fixed public and business capitals).[218]

On the other hand, it could be argued from Fisher's position that a

[218] Clarke and Islam (2005b), authors of the Thai ISEW, develop a health-adjusted national income (HANI) indicator of social welfare. HANI is supported by normative social choice theory and *not* by Fisher's net psychic income. HANI is different from a typical SEWI, as it is based on the premise that economic growth may have negative externalities that reduce human health.

SEWI would not merely be the income and outgo flowing from external wealth to the psyche. The heart of Fisher's well-being indicator would be foremost to consider the *status of their constitution* (the state of one's internal wealth in mind, body and soul), that is, in modern parlance, the stock of human capital, e.g. knowledge, bodily, mental and spiritual health etc. In this study, 'human capital' i.e. human-health capital encompasses a much broader and richer interpretation of the welfare-relevant aspects of the person-in-the-community.[219] On the contrary to the probable eminence of mental health in Fisher's well-being indicator, the heart of SEWIs is the psychic income and outgo flowing from "personal consumption expenditures" vis-à-vis the market economy. In other words, Fisher's 'Index of Net-Health-Welfare' is actually ill conceived/unfathomed in the SEWIs, because of identifying merely the income and outgo flowing from external wealth to the mind.

The conception of 'psychic flux' in SEWIs is limited. *To some extent*, it might be true that "[o]f all the past enjoyment of life an individual preserves only a memory of varying vividness" (Georgescu-Roegen 1971:284).[220] But this does not rule out the fact that the psyche is clearly changed in some respects as a result of actions individuals undertake. SEWI advocates observe a one-way production process of the stock of materials (commodities) whose consumption may lead to need satisfaction. External wealth is a general fund from which specific needs may be exogenously satisfied (subject to the "ultimate" availability of low entropy). Yet in SEWI, the mind is seen as a blank register of simple qualities supplied by experience to be processed in fixed and standard ways. That is, information on psychic satisfactions is a type of fluid that can be poured from one individual into another. However, the human mind creates (processes) information and a person does not just passively absorb information from the environment (see Twomey 1998:437-44).

Schumpeter (1911:83) believed the average person partly operates under conditions of habitual activity: s/he is a being operating under a system in which past (psychic) experience forms the heart of present action. Habit is a propensity to behave in particular ways in a particular class of situations. Our habits help to make up our preferences and dispositions. When new habits are acquired or existing habits change,

---

[219] This definition of 'human capital' separates itself from orthodox economics; it aligns to some extent with the neo-Marxian radical view of the social relations of production. As Bowles and Gintis (1975) critique, "human capital theorists have put forth *a one-dimensional normative framework* [that] ... *has no reasonable relationship to human welfare cogency*" (Bowles and Gintis 1975:82, emphases added). Human capital accumulation is thus a social activity because capital development is a social learning (and ongoing) process as people learn by doing and acquire new knowledge.

[220] He argues that the enjoyment of life can be enhanced (with longer leisure time) or diminished (with work drudgery) but this flux of life enjoyment *cannot* be accumulated in a stock (see Georgescu-Roegen 1971:ch.10).

then our preferences alter. Habit does not deny choice; there is scope for decision and will. Yet, institutions constrain our behaviour and develop our habits in specific ways that can be good or bad for social welfare (see Hodgson 2003:163).[221] Institutions are conditioned by and dependent upon individuals and their habits. From their habits, instincts, social norms, conscience, and volitions a person stores the fruits of past experience in an attempt to economise effort and simplify action. In other words, the whole of a person's organism is an *active* recipient and participant of economic life and life's enjoyment based on his/her experiences. Therefore, the crux of the problem: the theoretical apparatus of SEWI ignores the dynamic changes in the human psyche (whole person) and ignores the changing relationships between the psyche and psychic flux.

Then again, one of the well-known disadvantages of the ISEW is that it does not fully account for the stock of human capital (see England 1998:101). Many authors have noted some of the important limitations of SEWIs, i.e. that it does not include human capital (e.g. Neumayer 1999:87-8). Of course, Daly and Cobb (1989:404) explicitly stated they have excluded any accounting of human capital, improvements in the human physical (health), intellectual (educational) and emotional resources. Advocates acknowledge that SEWIs exclude human capital (e.g. Makino 2008:163).[222] For instance, Lawn (2003:115) concludes, "it is impossible to incorporate all welfare-related factors into a single index. Nevertheless, it may be beneficial to replace some of the lesser items currently included in the calculation of the ISEW, GPI, and SNBI with items that can be clearly identified as having greater welfare significance". "So long as the GPI is able to capture the most important benefits and costs" (Lawn and Clarke 2008b:70). Effectively, it is perceived as 'too difficult' to account for the change in the stock of human capital in SEWIs.

Undoubtedly, any empirical well-being index is fraught with measurement problems. But as Paul Baran (1957:36) in *The Political Economy of Growth* noted early on: "[d]ifficulties encountered in the measurement of a phenomenon should not be permitted to obscure the existence of the phenomenon itself". And so hypothesis H5 is significant to this analysis. Political economy seeks to eschew abstractions from the system to develop a pragmatic framework for analysing endogenous

[221] For instance, in mature capitalist economies, the growing stock of unhealthy human bodies is an agency–structure problem. While lack of personal responsibility is an element of the problem (especially for men), reaching healthier goals in a disembedded system is fraught with difficulty. The rapid increase in obesity over past 30 years in the West strongly suggests that influences from the cultural-surroundings are responsible for this rising trend (Mann 2008:175, Wakefield 2004). Current institutions promote a sedentary lifestyle, such as residential density, land use mix, and automotive commuting time (Frank *et al.* 2004).

[222] Although, Talberth *et al.* (2007) and Jackson *et al.* (2006) are some authors (of a handful) to ascribe full positive value to education in their SEWI.

processes through real time (Downward *et al.* 2002). The system includes real societies and human agents (persons) who undergo phases of development. Socioeconomic systems create new products and perceptions *and* create and re-create individuals: "[t]he individual not only changes his/her purposes and preferences, but also revises his/her skills and his/her perceptions of his/her needs. In terms of both capacities and beliefs, *the individual is changed in the process*" (Hodgson 2003:162, emphasis added). The individual is reconstituted by learning, which can change their psychic preferences, goals, capacities, skills and values. Learning is the reconstitution of individual capacities and preferences; this is equivalent to a change in individual personality or their 'cultural capital'. But the authors of SEWIs have accepted that the stock of human (and cultural) capital *is held constant in their measures*. This assumption is inconceivable with reality.

This vital oversight of excluding the 'stock' of human capital has empirical and conceptual insinuations for the SEWIs. For example, Nordhaus noted that in a health-income measure one must eventually consider the "extent to which improvements arise from improved basic knowledge (such as the germ theory of disease, the discovery of antibiotics, or the DNA revolution)" (Nordhaus 2005:389). Progress in the medical treatment of sick individuals advanced dramatically in the latter half of the twentieth century, i.e. global life expectancy rose from 46 years in 1950–1955 to 65 years in 2005 (UNDP-DESA 2008). Increased longevity is a result of improved nutrition, sanitation and hygiene, knowledge of health conditions, and the quick spread of medical knowledge and its application in health-care practices. Another measure of technological advance is the fact that many diseases that were not curable in the past can now be effectively controlled by diagnostic capabilities, medical procedures, equipment and pharmaceuticals (UNDESA 2007:115). Thus, Nordhaus may be right, but the extent to which the SEWI can integrate these very real and yet *qualitative* health dimensions into a net *income* measure is the critical question.

At the time of writing (April 2009), SEWIs do not account for the length of life or quality of the population's health. Crafts shows the empirical implications for not including an adjustment of life expectancy in ISEW (see Crafts 2002:87-95). Also, Nordhaus (2005:374-5) believes that including health status in income is particularly important when a large and growing fraction of the economy is devoted to health care. His results show life expectancy improvements are about as large as the value of all other consumption goods and services put together: "[l]ooking at the entire 20th century, the contribution of the increase in life expectancy [in the US] was between 59% and 126% of the contribution of income from all sources combined" (Nordhaus 2005:385-6,389). It is fascinating that the authors of *Sustainable Welfare in the Asia-Pacific*

(edited by Lawn and Clarke 2008d) realise the significant progress over the last couple of decades in life expectancy for most of the nations in the region. Yet, the authors do not mention or attempt to incorporate an adjustment of such a critical well-being variable in their GPIs. Consequently, incorporating an adjustment of life expectancy in SEWIs would dramatically alter the empirical account of the trend patterns (as told by SEWI advocates) and as shown in *Chapter 4*.

At the conceptual level, with the assumption of holding the stock of human capital constant, by definition, advocates of SEWIs cannot adequately account for the degree of human health or knowledge, because human capital is not their reference point. But, by *not* accounting for these changes in the net stock of human capital, one must rely on whimsical assumptions that the individual (or region, or nation, or local area) must possess perfect knowledge, perfect foresight, access to perfect information, and a stable constitution over time. These abstract assumptions are problematic to understanding the political economy of capitalism (H5). Therefore, one cannot claim both imperviousness from excluding the stock of human or health capital (as all advocates do) *and* theoretically cementing the SEWIs in Fisher's notion of net psychic income. This is because psychic income/outgo experiences are inextricably linked with the actual quality and perceived state of the mind, body, soul and knowledge. Because it is unwarranted to exclude the stock of human capital from the net psychic income index, a theoretical limitation of SEWIs has been disclosed.

On a related point, Robert Eisner (1994:100) said that it is difficult to make much of the measure of 'net capital growth' because the ISEW does not factor-in measures of investment and depreciation of human capital. Knowledge capital, for example, does not wear and tear like machines do, but instead becomes obsolete with the creation of new knowledge that displaces the old. The development of knowledge (such as R&D stocks) is a process of creative destruction; old knowledge is depreciated through the emergence of new knowledge (e.g. see Bitzer 2005). However, additions to or subtractions from the human capital fund vis-à-vis the 'flux' of net psychic income are not accounted for in the theory of SEWIs.

Rather than being concerned with the formation and change of knowledge, health and psychic preferences through real historical time, advocates have started with ceteris paribus assumptions where medium and long-term processes are not affecting the socioeconomic system. But in relation to hypothesis H5, for a realistic study the critical factors at work need to be endogenised. Human needs and preferences are not fixed, but culturally and individually changing over time and space. Brent Bleys (2008) recently argued against including the 'net capital growth' item in the ISEW for the reason that it is not compatible with Fisherian

income. But, the problem is that he has not thoroughly questioned the theory of net psychic income. It is argued that under Fisher's framework, the keystone of the indicator is a theory that specifies accounting for some sort of change in the stock of human-health capital. Yet, the removal the foundation stone, as somehow proposed by Bleys (2008), inescapably leads to a theoretical impasse for the ISEW.

In précis, closer reflection on these complex issues is needed before one can (fallaciously) conclude, as Philip Lawn does, that SEWIs are realistic and strong, theoretically. It emerges that in the process of attempting to theoretically ensconce the SEWIs in Fisher's idea of net psychic income, Lawn mistakenly reduces the conceptual soundness of the measures. Therefore, Lawn and some other authors have over-simplified the conceptual position of psychic income integrated as the primary ingredient within the ISEW/GPI/SNBI/YF.

6.3 Theoretical Incongruities of a Limited Ontology of 'Consumption' in a Disembedded Economy

It is now appropriate to clarify further one potentially valid weakness raised against Fisher's psychic income logic regarding consumption. That is, within Fisher's psychic income notion embedded in the SEWI, it may be tacitly assumed that "consumption" (in the 'using-up' sense) is directly related to welfare (e.g. Costanza *et al.* 2002). But, Fisher would disagree with this statement. Parallel to Boulding, Fisher (1939) too was careful to differentiate "consumption" between 'service'.[223] "So-called "consumption" is only a special case of service. Even the term consumption is misleading, for it implies that destruction is an essential result of service[.] ... "[C]onsumption", in the sense of literal destruction, does not help our analysis at all. *Only service helps*" (Fisher 1939:359-60, emphasis added).

While Fisher focused his research on services yielded from final artefact capital, he was probably open to a deeper interpretation: "[i]f the event is one which cannot be connected with purchasable commodities, it is necessary to imagine an exchange, even when actual exchange is impossible" (Fisher 1906:177). Fisher's concept of "yield income" (flow of service) was not only limited to 'consumption' as one of his critics (Graves 1939) thought. "[V]irtue in my analysis of income ... lies in its applicability to ... many sorts and combinations of services[:] ... [c]onsumption is ... significant ... but it is ... not the starting point" (Fisher 1939:358-9). However, the implicit value judgement inherent in the SEWIs is that personal consumption expenditures, i.e. services flowing from final artefact capital, are *the focal point* surrounding

[223] Boulding's (1945:2) literal interpretation of the word, 'consumption', is the "destruction of ... valuable things—in the way in which they were intended to be destroyed".

existence and well-being. This premise is contrary to Fisher's hypothetical "Index of Net-Health-Welfare" above (*Section 6.2*), where it is argued 'health' would be the starting point not 'consumption'. Yet, in essence, the SEWIs are *centred on* the benefits and costs associated with personal consumption expenditures (final artefact capital), rather than centred on the totality of benefits (services) and costs (disservices) flowing from multiple capitals.

In *The Great Transformation*, Polanyi (1944) argues that an extensive assemblage of technological and institutional change (with a calculated movement by the state during the nineteenth century) commenced an operation that enlarged the market paradigm. The inclination of markets to overrule and erode social, moral and religious capitals is known as the 'disembedded economy'. The disembedded economy is an autonomous sphere of human activity, self-regulated by an organisation of price-making markets, self-motivated by greed or the threat of hunger, and hence entirely based on self-interest, "dependent on non-pecuniary preferences, which it is intrinsically incapable of delivering" (Rodrigues 2004:195). In relation to hypothesis H5, this means that—for any study into sustainable well-being—*the key focus is the effect of the market economic institutions on society*. But, how do we differentiate between 'services' and 'disservices' of consumption in the disembedded economy?

Perhaps there are good reasons why SEWI advocates decided to have 'consumption'—a major component of GDP—as the starting point. A proportion of consumption involves acquiring some kind of gratification or avoiding some kind of impoverishment. This consumption is generally thought to give something internal to the individual consumer because of some intrinsic characteristic of the commodity consumed (e.g. use value). This is an *inner-directed* process, where consumption is for personal satisfaction—in Fisher's terms, the "psychic income". SEWI authors recognise the consumption associated with the so-called psychic service gained. But, to the extent that growing income and consumption is a function of declining health, status competition and addictive behaviour, then it does not reflect growing satisfaction. These are vital considerations, because a major assumption in the SEWIs is that well-being increases at the same rate as consumption expenditures. Several advocates have dealt with *some* of these issues in their measure (e.g. Lawn and Clarke 2006b), however, there is much more room for improvement.[224]

Overall, advocates ignore the existence of useless conspicuous goods in SEWIs.[225] In *The Theory of the Leisure Class*, Veblen (1899) argued that

[224] Lawn and Clarke (2008b:72) admit the more needs to be done to deal with the "qualitative dimension of consumption".

[225] As noted in *Chapter 4*, several advocates examine conspicuous consumption (à la 'positional goods') (see Cobb *et al.* 2000:9, Talberth *et al.* 2007:3).

"conspicuous consumption" is different from inner-directed consumption—an outer directed process—done to impress others or to avoid others' condemnation. Conspicuous consumption is driven through emulation rather than by internal satisfaction derived from the intrinsic character of the commodity consumed (e.g. Dugger 1989). Emulation itself is the attempt to gain prestige in the eyes of others by displaying a higher than average ability to pay. That is, in conspicuous consumption and emulation, the psychic income of one consumer is affected by the consumption of other consumers (i.e. relative to the other person). Therefore, without consideration of conspicuous goods in SEWIs the summation of each person's *absolute* psychic income would give distorted results.

This is because the economy can be understood as an "instituted process" of social interaction (Polanyi 1992), i.e. a collection of culturally determined institutional arrangements by which the heterogeneous agents receive their psychic income and secure their social reproduction. On this basis, an understanding of the political economy of capitalism is significant to give us vital insights into Net Welfare Indices (H5). Rodrigues (2004:192) argues that the individual motivations and preferences cannot be understood without reference to the institutional context that (partly) shapes and defines them.[226] If people are (relatively more) charitable in one place and egocentric in another, it is not human nature that differs but the social, moral or community organisation. Preferences learned under one set of circumstances can become generalised reasons for behaviour. Economic institutions *may* induce specific behaviours—for example, self-regarding, opportunistic, or cooperative—which then become part of the behavioural repertoire of the individual. Markets affect human behaviour and our preferences are internalised (endogenised) because allocation rules along with institutions partly determine what one must do or be to acquire one's livelihood (Bowles 1998). Individual preferences are thus *endogenous* because the socio-political environment to a degree shapes them. But, for the SEWIs, individual preferences are not conceived to be in any way endogenous.

In a conspicuous consumption world (where preferences are endogenous), it is not so much people's absolute living standards, their basic needs or physical comforts, but their position in the income and wealth hierarchy that matters. The income differentials are therefore more indicative of psychic wants than physical wants, but psychic wants based on outer-directed processes. Because the income comparisons are invidious, they can invoke envy and resentment. Duesenberry's (1949) *relative income hypothesis* makes it harder to vindicate the traditional

[226] "Preferences are reasons for behavior, that is, attributes of individuals that (along with their beliefs and capacities) account for the actions they take in a given situation" (Bowles 1998:78).

concern with income distribution in SEWIs (other than what little is necessary to remedy any residual hardcore destitution—less justifiable in already affluent countries). People are often more sensitive to changes in income than to absolute levels of income because tastes and preferences are altered as they acquire new lifestyles. Yet, private consumption expenditure adjusted by an index of income inequality is the *reference point* of measuring socioeconomic welfare (by most advocates of SEWI). This might be an unreasonable assumption in a world of conspicuous consumption.[227]

Psychic income is influenced by business entities as well as other person's wants.[228] Wants are partly contrived for people frequently because they are subject to the forces of advertising and emulation. Wants are themselves both inactively and purposely the fruits of the process by which they are satisfied. In *The Affluent Society*, Galbraith (1958) argues that the wants-creating process governs the wants-satisfying or needs-based mechanism, viz. the "[inter]dependence effect". A subpart of this so-called wants-satisfying mechanism involves consuming symbolic meanings of objects rather than the satisfaction of genuine needs or the use value obtained from them (Shipman 2004). In the disembedded economy vis-à-vis hypothesis H5, the enterprise system tends to concentrate more on the individual as *consumer* while paying less attention to their satisfaction as worker, parent, and carer. The market feeds off the constant production of difference; this is the problem of producer vs. consumer sovereignty.

Shipman (2001) and Holt (2002) criticise the supposed newfound celebration of "consumer sovereignty": the consumers' ability to make creative and even subversive (e.g. "nonconformists") use of the marketplace equating to emancipation. Gallaway (2005) argues that producer sovereignty is more effective when it creates an opportunity where power can be effectively wielded in multiple spheres (e.g. with the other domains of public, competitive and household sectors). Producer sovereignty is more powerful when it diverts resources away from public, family, churches, community, and work toward its own ends within the marketplace, and when it takes business away from small independent businesses—characteristics of the disembedded economy. There is some agreement in the literature that "consumer sovereignty" is largely a myth (e.g. Sirgy and Su 2000, Strasser 2002).[229] In any case, SEWI advocates

[227] However, it could be argued that the trend of Gini over real historical time is a good proxy for the degree of 'conspicuous consumption', as the wealthy spend the majority of their surplus labour (or leisure) on status-based assets/capitals, easily exceeding that which is needed for subsistence.

[228] Lee (1979:326) points out that "Fisher regarded business entities as devices by which human beings could obtain enjoyment from consumption".

[229] On the other hand, Rezabakhsh *et al.* (2006) show that increase in the use of Internet *has* created increased levels of consumer market transparency and their power. But, the producer–consumer power imbalance is complex to differentiate; it is difficult to cause a schism (split) between a "consumer sovereignty vs. producer sovereignty" world (see Thompson 2004).

have ignored the relevant discourse on producer/consumer sovereignty (e.g. Haigh and Jones 2006, Knox 2005). They have implicitly (unjustifiably) assumed *constancy* over time in the power imbalances between producers and consumers.[230]

How reasonable is it for Lawn and Clarke (2006b:104) "to assume that, through technological progress, the welfare-yielding qualities of most goods will continue to increase for some time to come"? In relation to SEWIs, part of the problem with this worldview is that obsolescence is not taken into account. Obsolescence is the physical or psychic process ('obsolescence of desirability') of becoming obsolete, outmoded or old-fashioned. Baran and Sweezy (1966) argue that a person's welfare as a 'consumer' can be unfavourably affected by continuous product innovation and obsolescence. Even informed consumers do not need obsolescence but receive it anyway because of the wants-creating system. In a modern techno-secular culture, the nature of the problem is more psychic than physical obsolescence: people will often buy a newer version of the latest portable audio/visual player even when their previous player survives subsequent generations; and cell phones built to last five years are now retired after only eighteen months of use. But, there is no real attempt to account for the potential costs of built-in obsolescence in SEWIs, as indicated by Anielski and Rowe (1999:10), although "[s]uch a study would be a worthwhile albeit hypothetical inquiry". Studies show that fashion obsolescence vis-à-vis ever-improving design style and incrementally improved features has a significant (yet subtle and indirect) effect on well-being (Brown 2002, 2004). Therefore, it is somewhat problematic to argue that through technological progress service benefits always increase for the ultimate consumer or to society in general.[231]

Under the Fordist and post-Fordist modes of regulation, the meaning and nature of consumption in these societies equates individual expression with material possession.[232] The empirical evidence presented by Andrea Migone (2007) and others suggest that consumption became increasingly self-referencing, more segmented and unequal since the early 1970s (especially in the US). High levels of private debt via the credit system during the early-to-mid 2000s in the West lead to the transformation of consumerism to *hedonistic consumerism* (Migone 2007:177). "Hedonistic consumerism" is the seeking of spiritual and ego satisfaction in consumption, where self-

[230] It is inexcusable of the SEWI advocates to ignore producer v. consumer sovereignty. "[T]he concept of national income and related national accounting measures are inseparably associated with the *assumption of consumer sovereignty*" (Dowrick and Quiggin 1998:95-6, emphasis added).

[231] The perceived decline in the durability of satisfaction *may* be reflected in changes in tastes towards flexibility and fashion and the need for novelty (see Dolfsma 2004).

[232] This is known as 'consumerism'—the possession/consumption of increasing quantities of commodities so that human beings can achieve self-development and self-fulfilment.

referencing wants are relentlessly stimulated and consistently excited:

> A self-replicating cycle of dream, desire, acquisition, and disillusionment is then established within which the search for novel products is really a proxy for the quest for psychological satisfaction of the desire. *Because of the nature of the process, disillusionment sets in after consumption, and new products must be found and consumed*. [Migone 2007:183, emphasis added]

SEWI advocates identify *partly* with the internal contradictions of hedonistic consumerism. They see the negatives of ecological crisis of consumption. Yet, the misallocation of scarce resources toward the individual psychic 'satisfaction' of self-referencing consumption (rather than meeting real needs) is not imbedded in their conceptual framework.

The process of choosing is in itself a time-consuming process, which is made harder by the trend towards more rapid obsolescence of existing models, and by variations in price at different times and in different places. Hamilton (2003:ch.4) and Mishan (1967) furnished significant detail to the relationship between the 'free' choices people face in decisions relating to their well-being and the consequent *dissatisfactions* associated with consumer goods.[233] In *Growth Fetish*, Hamilton argues that it is a weary effort to have to choose from a large range of products advertised intensively when their qualities are mainly beyond our ability to assess. For most people, it would certainly be less costly and less demanding to be subject to *fashion* that changes less frequently. The crux of Mishan's (1967) argument in *The Costs of Economic Growth* is that there can be no presumption in an already affluent society that an increase in the area of choice increases human welfare. He argues that many important choices made by a person at some moment of time come to be regretted soon afterward. This is problematic because ordinary people become anxious about the increasing possibilities of choosing the wrong thing as the pace of fashion accelerates, as goods become technically more complex and the mixture flourishes (Mishan 1967:158). Thus, according to Mishan and Hamilton's analyses of consumer "free" choice, the community is not genuinely receiving psychic income, but, rather, *experiences psychic outgo*.

In a culture obsessed with appearance (e.g. in the US), as Jonalyn Grace Fincher argues, women are far less free in a system thriving on the "Creed of Materialism". It asks us to derive our meaning and our sense of worth from the unbidden reactions in other people's faces:

---

[233] It is significant to note the abnormal dynamic that makes the "chronic dissatisfaction" that Veblen (1899) refers to. Vicious downward circular and cumulative effects occur, which are the attempt to overcome this chronic dissatisfaction (i.e. psychic outgo) by acquiring more commodities (that do not provide genuine psychic services).

> I may be free to vote and free to learn, free to teach and free to travel, but I am not free to be fashionable and disregard that sexy look. Thanks to marketing, clothing cuts, models, and actresses who double as sex kittens, *fashion and sexiness have become inextricably linked*. Trained to criticize other bodies, we gradually turn our critical, dark eyes on ourselves. And that is where *many* of us are—distracted, discouraged, and embarrassed over our bodies, convinced that we have much to be ashamed of, plenty to suppress. How many women do you know who like trying on swimsuits? [Fincher 2007:41, emphases added]

In other words, fashion is bad when it fosters spiteful competition between women because it distorts the real (true) meaning of womanhood and their freedom. With too much time and money spent on 'beauty', the material-fashion message of society is promoting destructive (envious) desires—so characteristic of present-day disembedded economies.

In summary, SEWI advocates do not account for conspicuous consumption, psychic obsolescence (linked to fashion), and the psychic outgoes (dissatisfactions) endured from an abundance of choice of consumer goods. This is a surprising result. These aspects are significant to our modern consumer culture, particularly in the West during the 1950s–2000s (à la Galbraith, Mishan, Hamilton). Moreover, as argued in *Chapter 2*, a large extent of the GDP growth is probably a good proxy for conspicuous waste, the social preference of Veblen or fashion goods, particularly in a highly disembedded system. GDP is the very measure advocates wish to take away from the policy limelight. Yet, by *not* accounting for these negative forms of consumption in their analyses, the link between real welfare in the disembedded economy and the 'net psychic income' in SEWIs is distorted and hence questioned. With respect to hypothesis H5, the advocates have not solved these more weighty theoretical problems in the SEWIs, because they have a weak socio-historical institutional apparatus. Given this flaw, what are other 'ceteris paribus' assumptions of the capital stocks entrenched in SEWIs?

6.4 The Conceptual Problems of a *'One-and-a-Half Contradiction World'* under Commonsensical Accountancy

The primary concern of the MCP "is to incorporate in theory and empirical analysis *a role for community relationships, the social foundations of wealth*, and the possible negative influence of durable business capital

on the environment and society" (O'Hara 2001a:122, emphasis added). The MCP's scrutiny of the social foundations of wealth is, at heart, much aligned with Daly and Cobb's (1989:379) *economics for community*. Out of all the heterogeneous forms of wealth (capital), these social foundations would entail a discussion of services/disservices flowing from *social capital*. This is because social capital formation depends on "the quality of the set of relationships of a social group" (Szreter 2000:57).

The principal services or welfare benefits of social capital are in the form of trust and sociality. Everyday interactions between people in a community (in which the family is situated) build trust and reciprocity: the durability of community bonds frequently determines its resilience and cohesion (Stone 2001). The investment of people transforming their relationships for the better, that is, when these relationships become more loving, compassionate, and joyful, involves increasing well-being and beneficial services (Tomer 2002). However, there are negative events associated with a lack of social capital—'anti-social capital' (Streeton 2002)—such as the defensive costs (disservices) associated with distrust, disconnectedness and inhibited sociality. For example, the costs associated with forming legally binding (formal) social contracts rather than engaging in acts of informal good will; the increased time in transactions taking precautionary and repetitive measures to build trust or repair distrust in personal relationships; or the public costs of setting up investigations of commissions into anti-trust-corruption crises. In essence, social capital engenders qualitative activities that create social relationships that *potentially* provide lasting productive or personal capacity.

There are *dynamic linkages* between persons-in-community in the systemic circuit of social capital (O'Hara 2008a). The problem with characterising a Fisherian well-being indicator is that "[he] took the view that the *world is deterministic*, that it is only our ignorance of nature's laws that makes events unpredictable" (Tobin 2005a:210, emphasis added). In an overdeterministic world (Resnick and Wolff 2001), complexity is the case when the development of psychic income is promoted or inhibited by the surrounding socioeconomic conditions and institutional framework. For instance, personal development depends on a liveable and trustworthy society; some studies (e.g. Helliwell 2000) have shown that *trust* is one of the most significant aspects of social capital. In the process of wealth creation, particular forms of capital (e.g. ecological, human and social capital) may unsustainably degrade or sustainably be enhanced over time. In other words, a potential dialectical contradiction that needs to be explored in Daly and Cobb's 'economics for community' framework is between the accumulation of final artefact capital (in the form of disservices) *and* the lost services of social capital. ISEW, for example, is designed to account for the 'future welfare reductions' of the

ecological capital services lost.[234] Why not, in a similar fashion, measure the 'future welfare reductions' of the social capital services lost? Therefore, the crucial question for the SEWI advocates is: *To what extent does social disservice items permeate the 'sustainability' of society?*

To some degree, Cobb *et al.* (1995) from *Redefining Progress* have contemplated these matters concerning society's well-being and updated the ISEW framework to include social dimensions. For instance, they include the additions of volunteer labour, and deduct costs of unemployment, underemployment, and involuntary leisure. In addition, GPI accounts for some 'social capital' aspects that are quantitative/monetary-based. For instance, the physical accounting of social capital includes crime rates and divorce rates (a proxy for family breakdown). The *quality* of the social capital stock *may* also be gauged in GPI: i.e. adding the benefits of household, parenting and volunteer labour and subtracting the costs of divorce and crime. The "net quality of relationships" (Daly and Cobb 1989:161) is *possibly* captured in their measure. Subsequently, albeit in a limited and circuitous way, the GPI observes the potential contradiction between the capital accumulation process and short and long-term social decay.

To what extent does the inclusion of the "new" social variables genuinely reflect this contradiction between economic activity and the community's social structure? Not much—unsustainable social disservices to the community are monolithic, and, for instance, merely accounting for them through measures of 'television watching' and 'divorce rates' is vastly blinkered, and highlights the limitations of the exercise. At least the authors of the US GPI acknowledge that their estimate is conservative because "they do not include the informal neighborliness that does not involve a volunteer program or agency" (Anielski and Rowe 1999:8,15).[235] But advocates are unaware of *asocial* forms of social capital under "volunteer labour". For example, durable anti-social capital such as the Ku Klux Klan, organised crime, terrorist networks, and war mongering. Additionally, all SEWI analyses exclude mutual trust and reciprocity because of their weak definition of 'wealth'. Therefore, another underlying assumption of SEWIs is 'holding constant' the stocks of social and human capital, which treats all the basic forms of capital as *separate non-interrelated entities*, which is obviously not the case (e.g. see Bourdieu 1983:183-98, Cochrane 2006).

This oversight of excluding critical forms of capital has conceptual implications for SEWIs. Advocates need to be mindful of Mishan's (1994)

---

[234] According to Stockhammer *et al.* (1997:21), 'future welfare reductions' (i.e. the depletion of ecological capital) are "costs that will probably arise normally without any exact knowledge available as to when they will occur and in what magnitude".

[235] Interestingly, in a recent study of the US GPI, Talberth *et al.* (2007) exclude the disservices of family breakdown. No reason or implicit clue is given for the omission of this item; yet it was included in five earlier efforts at *Redefining Progress*.

argument:

> The more we begin to reflect about the incidental but far-reaching consequences of rapid industrial progress upon the many intimate aspects of human welfare, the more we become prey to searching doubts about the possibility of constructing a welfare index. For in the process of adapting our lives to cope with rapid scientific and technological change, *so much is happening simultaneously to our routines, to our tastes, to our manners, to our conduct, to our self-regard, to our character and our values, and therefore, inevitably also to our capacity to enjoy life, that any index of the changes in the amounts of goods available to consumers would seem quite incidental to trends in the over-all experience of welfare*. I have to confess, then that I find it hard to avoid feeling oppressed by an enervating sense of the futility of such an exercise: as if one were engaged in a desperate but foredoomed attempt to *extend the dimensions of an already crumbling edifice*. [Mishan 1994:190,191, emphases added]

In relation to hypothesis H5, the critical point that Mishan (1994) raises above is what Polanyi (1944) argued, i.e. the quandary in SEWIs of implicitly assuming no negative effects on mutual relationships, values, character, self-regard, conduct, manners *when consumption rises (and markets expand) over time in the disembedded economy*. The raw substance of this section's fundamental critique is thus: That the cost of the lost social capital services (i.e. the weakening of existing patterns of social relationships) is almost unascertainable in SEWIs because certain implausible assumptions are utilised about the linkage between consumption and societal decay/progress.

It is instructive to consider Schumpeter's (1943:ch.7) significant concept of "creative destruction": capitalism is unavoidably a simultaneous process of creativity and destruction. In principle, the SEWIs are relatively good at methodically gauging the destruction of ecological capital for the creation of services from human-made capital (vis-à-vis competitive innovation). For example, because of innovation, the individual/society is able to benefit from the services derived from various forms of artefact capital: e.g. the Internet, more powerful computers, wind turbines for electricity generation, or recyclable pro-consumer products. In principle, these created services are found in the 'person consumption expenditures' component of SEWIs. Yet, in a production society, there are throughput costs (such as pollution) and other permanent environmental losses (e.g. old growth forest). The SEWIs measure these destructive costs in the 'depletion of ecological

capital' account. Thus, they identify one crucial contradictory dynamic of capitalism: the contradiction between environmental production (protecting the public goods of clean climate) and business.

A critical principle of political economy is that one must assess the *multiple contradictions of the disembedded economy*. The notion of contradiction is defined as something endogenous to the system, that is both central to its positive operational dynamics as well as being a necessary negative outcome (O'Hara 2007a). There are positive and negative features of socioeconomic systems that are endogenously entrenched in the fabric of various processes, institutions and relationships. In short, capitalism has negative and positive effects on social well-being; it destroys and creates. We thus cannot separate the destruction of economic values and habits from the social lives of people in a measure of sustainable economic welfare, such as the (superficial) "*Genuine Progress* Indicator".

An additional hypothesis (H5.1) is therefore raised:

H5.1: Multiple contradictions assess the complexity of the disembedded economy better than single contradictions.

There are multiple contradictions of capitalism to be explored, but it is hard to link all of them in one index. While contradictions are relatively autonomous, it is problematic to treat one dialectical contradiction as completely independent of the others. The notion of the disembedded economy is critical to understanding the multiple contradictions of global capitalism, and it links to various problems in all areas of the social economy (H5.1).

The SEWI advocates focus mainly on the contradiction (i.e. the trade-off) between the natural environment and consumption goods. They are obsessed with the natural environment; yet only handle society to a limited degree. They are in a *one-and-a-half contradiction world*; they see primarily *one* contradiction and a *partial* social reality. Yet, in the global disembedded economy, all areas of life are both relatively autonomous yet interconnected (e.g. Stanfield 1986:ch.4). Because neoliberal capitalism creates markets and relentlessly expands its sphere of influence, the creation of markets and new products often occurs through the destruction of non-market relations—the vital contradiction misplaced in SEWIs.

Because creative-destructive processes predominate in the macrocosm of capitalism, there are implications for SEWI advocates rapt in a one-and-a-half contradiction world. The SEWIs effectively hold all other contradictions constant: the inextricable linkages are invisible to advocates. Displacing the contradictions of the disembedded economy in the analysis is *theoretically incongruous with the reality of social life in a*

market-dominated economy (H5.1). In the disembedded economy, the market society must not place family, friendship, or community relationships ahead of pecuniary success; they must acquiesce in the market society. As a result, services derived from social capital decline in quality as they become consumeristic and pre-packaged, thus losing much of their spontaneity and their capacity to satisfy fundamental human needs (Stanfield 1995:ch.6). The breakdown of this dynamic function of nurturing people who can share (with discipline by being faithful) in supportive social relationships is the "Nurturance Gap". Stanfield and Stanfield (1997) argue that there are adverse effects from the market society of strong individualism, including a breakdown in society, the inability of people to trust one another, and a decline in nurturance and love.

Of course, SEWIs measure a range of regrettable social-disservices, which historically do little to add to welfare, but merely maintain welfare. Defensive and rehabilitative expenditures are not welfare enhancing as "they merely serve to maintain and restore the productive capacity of the economy" (Lawn and Clarke 2006b:22). For example, authors of the original ISEW have excluded the majority of government expenditures: "[t]he growth of government programs does not so much add to net welfare as prevent the deterioration of well-being by maintaining security, environmental health, and the capacity to continue commerce" (Daly and Cobb 1989:467). However, innumerable social-disservices are not accounted for in SEWIs, yet they are detrimental to one's *current* well-being, i.e. the agencies that come into corporeal being in response to public demand to relieve anxieties; such 'services' were not needed in the earlier economy of small towns and villages (Mishan 1994:191). The so-called services begin to exist and flourish as people are more mobile and more alienated, as city areas increase to unmanageable proportions, and as people's manner of living become more complex and uncertain as a result of material possessions. *The disembedded economy innately reproduces these (dis)services*.

In conclusion, there has been an over-simplification of the role of society, and a deficient analysis of the contradictions of capitalism in SEWIs. Lawn seems to have mastered 'current and future welfare reductions' relating to ecological dimensions, but he and others have insufficiently detailed *how social dimensions relate to sustainability* in a disembedded economy (H5.1). The SEWIs cannot answer the following crucial question: In a path-dependent economy, what are the medium and long-term actual disservices flowing from social capital degradation? Advocates have not dealt adequately with the possibility of *social (un)sustainability* in their measures.

Why? As argued in *Chapter 4*, advocates of SEWIs use common-sense operational procedures anchored in a simple plus-minus technique.

While common sense is important in social economics, and central to justify social values (see Hobson 1914:320-22, Moore 1959:52-9), the sensible plus-minus *technique* founded on the GPI specifically gives attention to method, *not* theory. The authors' accountancy scheme must rely upon *ad-hoc* changes because there is no strong theoretical *socio*-historical institutional framework to act as guidance. The problem is when ad-hoc techniques override the building of a solid theoretical foundation. There needs to be detail that provides a theoretical avenue for the SEWIs, even though advocates submit that ISEW/GPI/SNBI/YF are only a first step in the process of understanding activities contributing to and depleting well-being.

But as a result of the lack of a concrete theoretical (social) foundation, the SEWIs do not—and therefore cannot—satisfactorily answer the following crucial question that Cobb *et al.* (1995:45, emphasis added) proposed: "How do the activities of the market affect the *sustaining matrix of the social structure* and natural habitat?" Because ad-hoc commonsensical accountancy prevails, the authors are inadequately accounting for the *present* well-being effects on the social structure, and do not consistently, as done for ecological capital depreciation, value the *future generational costs (lost services) of an (un)sustainable social capital and human capital base*. Obviously, this is a difficult task because of uncertainty and measurement issues—and thus one does not completely know the path-dependent effects of social un-sustainability.

6.5 Misplaced Concreteness of Solitary Restriction to Monetary Imputations under Uncertainty: The Break between Psyche and Income

Part of the controversy of Fisher's psychic income concept is due to the problem of translatability into units capable of statistical measurement. How do we measure 'psychic income'? According to the mathematically gifted Fisher, every intermediate transaction involves both the receipt and an expenditure of equal magnitude, which cancel out in arriving at the total income. There is no further exchange of monies once a final consumer has obtained the serviceable good.[236] The satisfaction yielded to the consumer by this capital asset is the 'net result' of all gross transformations and transactions that went before. But, this so-called uncancelled figure must be diminished either to a greater or to a lesser extent by the psychic disservices acquired. This 'final uncancelled' amount is the *net psychic income*. Hence, for Fisher, net psychic income is the final net benefits of economic activity. Fisher (1906:177) thinks it is easily achievable to measure net psychic income by monetary prices, and

[236] But as argued in *Sections 6.2 and 6.4*, individuals or persons (i.e. as final consumers) can change over historical time when they have obtained the serviceable good.

Lawn would agree. Explicitly, Fisher would concur that over a wide area of life, market price supplies us with some sort of standard of relative values, which is 'objective', at least to the partial degree that it results from an accord of a multitude of (market) valuations.

However, the market price of a good is often a poor indicator of its marginal value to society. Benefits conferred and damages inflicted on other members of society in the process of producing or using particular goods often do not enter the calculation of market price. For instance, the destruction of fisheries or increased mortalities from respiratory and heart disease (e.g. see Steingraber 1998) do not enter into the profit-and-loss calculations of economic enterprise, which get their signals and incentives from market prices.[237] The 'market forces' of the private enterprise system do not guarantee ecological sustainability of the throughput (see Daly 1996). Most ecosystem services (i.e. ecological capital) are greatly undervalued, if not accounted for at all. Ecosystems, such as wetlands, are considered non-existent markets, and the current structure is one of an open access regime, especially in relation to the ocean (Costanza 1999).

On an encouraging note, SEWI adherents recognise some of the problems above in utilising price. Stockhammer *et al*. (1997) advise caution regarding the use of monetary values, and, Castañeda (1999:243) provides a critique of market prices and valuing ecosystem loss. Lawn (2004a, 2007a:ch.5) also converses about 'price', but argues that there are means to which a market society can measure better the monetary value of unaccounted service flows. Indeed, SEWIs convincingly measure a sizeable part of the depletion of ecological capital because they are based on well-substantiated empirical computations.[238] Lawn adopts the somewhat reasonable assumption (at least applying to the microeconomic level) that "[p]eople will generally pay a higher price for a commodity embodying superior service-yielding qualities. Consequently, a measure of psychic income can be approximated with the use of market prices" (Lawn 2001:223, 2005:194).[239] The tacit assumption by Lawn is that markets are voluntary exchanges that reveal concrete choices and place a monetary value on that choice (i.e. the agreed upon price).

However, subjecting and justifying an indicator of net welfare to monetary evaluations *only* spoils the effectiveness of the indicator in other ways. Monetary assessment is about using prices as an expression of what things are worth, but not all prices reflect the real worth of things (Røpke 1999). Rees and Wackernagel (1999) affirm:

> Money-based approaches can seriously mislead[.] ...

[237] There is an attempt to measure the negative externalities from the production process in the SEWIs, but these disservices are measured by monetary prices also.
[238] For example, El Serafy's user cost of capital is a good method (see Dietz and Neumayer 2006a).
[239] See also Lawn and Clarke (2008b:72-3).

> [P]rices ... do not ... reflect ... *unaccounted service flows*, or *informed social preferences*. This insight should be seen as a *fundamental premise of ecological economics*. The over-riding problem here is really one of *misplaced concreteness*. People tend to forget that *money per se is an abstraction*, a convenient stand-in for (usually tangible) things of value. [Rees and Wackernagal 1999:47, emphases added]

Moreover, in the words of Andri Stahel (2005), use- or exchange-value is "an emergent, context dependent relational property. ... It is only within this larger framework that the net effect of any particular commodity in terms of social and ecological wealth creation ... can be assessed" (Stahel 2005:373,377). Hence, the validity of the link between price, money, value and the services/disservices is challenged.

Price equates little or nothing with value or the benefit itself. Fisher for the most part accepted the opposite of that claim; i.e. price is a good proxy for value. Value is the product of an observed quantity and an observed unit price, and has subjective causes (Fisher 1906:14-5). For most items, he sees the tapestry involved in the generation of psychic income as simply calculable in money terms, because the diversity of quantities of services and disservices is reduced to homogeneity in value terms by multiplying quantities by their several prices (see Fisher 1906:120-2). He, and of course Lawn who followed him, believed that money receipts are good proxies for psychic income (see Fisher 1906:137).

Herbert Frankel supposedly disclosed a fallacy in Fisher's logic, namely, the logical distinction between evaluating 'objective' accounting concepts (recorded transactions) and evaluating the subjective processes in a person's own mind. Fisher, according to Frankel (1952:11,14), has to invent a bridge between "two logically different and incompatible categories of thought" to reconcile all the aspects of income. One that exists in the marketplace when the satisfactions are derived from consumption (those that flow through the cash drawer) and others that do not, e.g. those that occur in human relationships, or from the comfort derived from their own furniture, or the shelter derived from a person's own house. These latter forms of (psychic) income are passed beyond the cash drawer and are those that occur, as Fisher says, 'inner to the mind'.

Of course, SEWIs (and GDP) are only approximations of value because "a measure of" a value is not the same as the value itself. SEWI is best thought of as practical approximation of welfare. However, SEWI advocates are satisfied with a 'depreciation rate' via *market prices* to represent the psychic services from goods. Consider the following example that portrays the dilemma of accepting market prices as rough

proxies for the 'psychic income' derived from final artefact capital. The psychic income yielded from an imaginative novel or a holy book, say, lent by a friend, purchased at a second-hand bookstore, or even if full retail price is paid, could be astronomically higher than the 'market price' or the depreciation rate given. The 'consumer surplus' for the individual is said to be great. One could have a life-changing experience from these desirable events, i.e. incredible 'in-the-mind' experiences (of the psychic service). But the probable results are positive, circular and cumulative effects on society: increases in the durability of social and cultural capital, and ultimately a higher level of net psychic income. Again, this example highlights the inseparable connection between psychic income generation and other forms of capital stock (H5).

Still, Fisher realised that market prices are sometimes poor substitutes for the actual value of services yielded. For example, because of his interest in the health of persons, he was cognizant that if the value of *real services* of artefact capital or money spent on them to make human beings unwell, as so often do dark-room tenements or drug addictions, their value is a figment of the imagination and a trap, however great their market value or perceived benefits (Fisher 1937:29). In Fisher's logic, the actual intensity of the service benefit in terms of psychic income is less than the monetary receipts for the artefact capital (i.e. consumer capital goods). The monetary receipts of, for instance, conspicuous fashionable items or unhealthy processed foods are poor measures of the 'true' value of psychic income. That is, the psychic income received (as superficially measured by monetary receipts) would be overestimated or wrongly interpreted as psychic income in the first place.

If one were to utilise Fisher's net psychic income empirically as a socioeconomic indicator of welfare then these artificial and overestimated satisfactions should be accounted for. Addictive behaviours such as excessive consumption of alcohol, smoking and fast foods are destructive (waste) disservices to the individual human body and society (e.g. see Schor 2005). These negative phenomena demonstrate empirically that there is ambiguity of measuring psychic income and explicating them in a monetary-based SEWI. SEWIs already include items to capture *some* of the costs of undesirable forms of consumption (e.g. the impact of additional health costs and reduced productivity) (Lawn 2001:260). "There is ... the potential to double-count some of the costs by omitting a certain percentage of all consumption expenditures on the assumption they provide few if any benefits. Clearly, there is a need for further debate on this issue" (Lawn 2005:193). However, Lawn does not explicitly recognise the *problem of price and the undervaluation/overvaluation of the psychic service and disservice*.

A further dilemma now encountered is the problem of an *unknown future* in the 'depletion of ecological capital' component. We are by no

means certain that net consumption per capita will be increasing or decreasing over the next one or two decades. A great deal depends *inter alia* on success in controlling effluent, pollution, resource depletion, the scale of illegal immigration, crime abatement, and conflict avoidance. These are important considerations, because Lawn expands on Daly and Cobb's (1989) idea of 'optimal scale' to provide a theoretical foundation for SEWIs (e.g. see Lawn 2007a:30-4). "Knowledge of where an economy is in relation to the optimal scale—where a decline in the GPI [or ISEW] represents growth beyond the optimum—can serve as an important indicator of impending unsustainability" (Lawn 2009:1899).

But, what is the actual optimal path at which we shall grow, given that SEWIs are purely pecuniary-based indicators? There are many incidences where nature has proven to be incredibly resilient, and nature can fully regenerate from human restoration projects even after significant long-term degradation (see Flannery 1994, Suzuki 2002). Indeed, in an uncertain world, we simply do not know. For illustration, Keynes was very interested in decision-making under conditions of uncertainty, as he said there is a need to make decisions with *insufficient or uncertain knowledge*, such as investment decisions (see Minsky 1975). Keynes used 'subjective probabilities', that is, a person's own idea of what they think is going to happen. These can change quite rapidly and, under uncertainty, people do not know (for example) the price of silver or the interest rate in twenty years time (Keynes 1936:ch.12). In another viewpoint, post-Keynesians (Harvey 2001) say that due to lack of information for investment decision-making, investors need to rely on the present circumstances as being a reliable guide to the future—although the investor knows they are not. In a non-ergodic, uncertain world in which processes do change over time, it is impossible to infer accurately from the past about the future, especially to building probability distributions or calculating optimal values (Lavoie 1992).[240]

There must be a rejection of the idea of "optimality", even if adhering to the precautionary principle. There is imperfect knowledge not only about ecological systems, but also about unexplained phenomena and uncertainty in all forms and aspects of life processes. Sometimes the actual flow of the disservice is not known with certainty, because of asymmetric information and moral hazard (Stiglitz 2004). Many people are not fully informed about the health implications of a whole range of environmental toxins (see Thomas 2003), such as fluoride (Bryson 2004) and pesticides (Pimentel *et al.* 2004). In combination with a myriad of untested potential carcinogens every year flowing to human beings through the market, on top of polluted air and water sources, there are multifaceted affects on the health of humans (Eyles and Consitt 2004).

[240] But there may be *varying degrees of uncertainty* because 'uncertainty' is a function of the weight of evidence.

Fred Hirsch's (1976:26,40) concept of the ''tyranny of small decisions'' captures the idea that uncertainty and incompleteness pervade individual choice within a market context. Individual choice is not always the best guide to appraise what individuals would have preferred if they could take into account all the consequences of their combined isolated actions. Questions are thus raised about the competence of SEWIs to deal with real-world problems in an environment of uncertainty and lack of information.

There can be situations where psychic outgo is undervalued or not accounted for at all in the final price or monetary sale of artefacts. Consider the outgo undervalued in such artefacts directly produced by slaves (or through extremely undesirable labour conditions) and exported to Australasia, Europe, and North America. For example, toys from China, where up to 70 percent of the world's toys are made (HKCIC Bezlova 2002, 2003), and metal goods such as steel made into the cars, and car parts which make up a quarter of all Brazil's exports are often produced by 'new' forms of slavery (see Bales 2004:25). We have the situation where the enslaved person experiences the psychic outgo (deplorable labour conditions), but the individual buying the artefacts (toys or a car) receives psychic income and does not experience the actual disservice generated. This raises some critical questions for the advocates of SEWIs: Are the global and regional dynamics of net welfare adequately captured in the SEWIs? Are we interested in individual or societal well-being? The lesson here is that despite the recent calling for an "Open [Ecological-] Economy GPI" (e.g. Clarke 2007) many questions remain unanswered.[241]

The crucial point is that an individual human being does not always have perfect information or knowledge about the authenticity a service or disservice may be providing them, society or the environment. (Speculative bubbles are also an example). The sheer quantity of available artefacts—brought about by economic growth—engulfs the human ability to make responsible choices. The difference between the actual disservices generated and the unaccounted-for psychic outgo is due to multiple factors, e.g. social filters and institutions, but probably awareness issues and contradictory worldviews are the most important. Human beings do not have time to research the living and labour conditions of the people who produce everything that they buy. Thus, human beings do not always behave rationally and think like 'homo-economics' agents. They behave habitually as *hetero socio-economicus* beings (see O'Boyle 2000).[242]

This is partially why the idea of striving for some sort of 'optimum level' of sustainable development, as measured in a monetary-composite

[241] These issues are explored in *Section 6.7* below.
[242] Edward O'Boyle utilises the term, '*homo*' *socio-economicus*.

indicator of sustainable economic welfare, such as Lawn and Sanders' (1999) and Lawn's (2006b:39) SNBI, is contentious.[243] In relation to hypothesis H5, in the current system that endeavours to ensure people change their wants as rapidly as possible, the economic system is quite capable of creating perpetual dissatisfaction, à la 'psychic outgo'. We are not in a position to measure in monetary-terms over time an "optimal level" of net psychic income. Although it is preferred, humans will never know how much an empirically calculated optimal value of net psychic income differs from the 'true' optimal or satisfied level. In summary, no advocates observe the issues of asymmetric information and the undervaluation or overvaluation of the psychic income explicitly as an intangible tenet within SEWIs. The problems of linking price to welfare (which the advocates ignore) are critically evaluated in *Section 6.6*:

6.6 Beyond Mere Measurement Problems in Price and Welfare: A Systematic Understanding of the Political Economy of Capitalism is Needed

It is argued that part of the problem for SEWIs is the stringent reliance upon monetization—prices multiplied by quantities—as the *only* proxy for dimensions of psychic income and well-being. While Lawn notes that human-made capital includes 'labour', which could include an innumerable number of social services and disservices, he conceals the problem of valuing such services via 'price', simply because he does not consider them in the conjectural analysis of the SEWI. Once again Mishan's (1994) words of wisdom seem to be neglected; for that reason, they are worthy of an aide-mémoire.[244] To be consistent, any freely proffered personal service *may* be evaluated by reference to the market price of a surrogate service. However, a value so attributed could be a gross under- or over-estimate: "[f]or the worth of the service to the recipient depends, or should depend, upon the *spirit in which it is offered and the spirit in which it is accepted*" (Mishan 1994:188-9, emphasis added).

With respect to hypothesis H5, a thorough analysis of economic processes acknowledges the psychic income generated within non-exchange relationships. Reciprocal and redistributive transactions are a significant element of the social economy; they are different from market exchanges (Polanyi 1944). The nature of real services engendered within

[243] However, Lawn (2006b:39) says that in a coevolutionary world such an optimal macroeconomic scale "would not precisely exist nor be precisely attained". The author states that SEWIs must be supplemented by a satellite account of natural capital to determine whether the changing level of economic welfare is ecologically sustainable.

[244] In all of Lawn's works (at least up to the time of writing, April 2009), there is no evidence of him openly discussing Mishan's (1994) critiques. However, occasionally Lawn does allude to the problem of 'quality' versus 'quantity' in the GPI.

them is critical. Generally, the personal services that others give us as a free offering can be regarded potentially of great value, because they come from a sense of responsibility, of reciprocity or of charity; otherwise from love, affection, esteem or tenderness. One can readily extend the same reasoning to the entertainment and affection that one enjoys when providing or receiving hospitality: and extend it as well to games with friends, to the counsel and comfort they sometimes give us, and even to accommodation and assistance in needy times. There are substitutes for such voluntary and friendly services, for instance from television programs, counselling and other agencies. However, in every case, the market surrogate is only formally compatible, because it cannot give the sympathy of a friend or relation, nor can it engender the flow of feeling coming from services generously given and received. Yet, time being money and money being the ecumenical calculation of worth, advocates are *constrained to a narrow selection* of social services *and* social disservices within their SEWI—restricted by not measuring the true character of service/disservice.

For this reason, a monetary dominated index of net welfare, such as the ISEW/GPI/SNBI/YF,—by design—eschews any social sustainability foundation. Advocates obviously concur that so-called nonmarket production exists, but is this regarded seriously? Are nonmarket transactions examined on their own terms, or given secondary treatment as an instance of exchange with less than explicit relative prices? They are indeed treated as an afterthought; that the nonpecuniary is priceless and therefore worthless. *Because the measure of welfare is chiefly restricted to the monetary value of goods consumed*, these incalculable services cannot be included. Yet, such social services and disservices are elementary for critically evaluating the multiple contradictions of capitalism in a disembedded economy (H5.1). As Hirsch (1976:87) argues, the forms of informal exchange, mutual obligation, altruism, love and so on are critical to the inquiry into the sustainable social welfare effects of universal commodification. To some extent, the ideology of disembeddedness—*now infiltrated within the framework of SEWIs*—both excludes and disparages social problems and democracy, and tries to make them irrelevant. In relation to hypothesis H5.1, they are now *permanently wedged* in a 'one-and-a-half contradiction world'. Therefore, solitary restriction to a constant (real) price and quantity-based measure in the SEWIs (subjugated by consumption) buttresses the doctrine of the disembedded economy, because there is no social sustainability basis.

Political economists emphasise that there is a wider meaning of economic welfare than found in the ideology of disembeddedness. Throughout human history, particularly in a disembedded economy, the inherent social message of 'money' is exchange and substitutability; e.g. substitutability in nature for industrial inputs, social relationships for

impersonal market exchanges (Hansson and Wackernagel 1999:205). Viewed from this angle, if the substitutes are easily measurable and 'rightly' valued, then monetary valuations would be adequate. But, we tend to lose confidence in the index of net consumption (i.e. the SEWI), when we place a money value on *all* services (Mishan 1994:181). This is because of the problems of putting a money value on factors not included in commodity production. "Yet having decided to cut the Gordian knot by adopting the device of measuring changes in welfare by changes in net consumption, we are exempted from bringing these incidental satisfactions into the [SEWIs]" (Mishan 1994:176).[245] In summary, the celestial point of 'consumption' in the SEWIs is not only a problem in itself (as discussed above in *Section 6.3*), but also one of misplaced concreteness of money and nonmarket exchange in a disembedded economy.

The reasons for the ISEW/GPI/SNBI/YF not including the services and disservices qualities of human and social capitals should now be obvious: How does one instrumentally place a monetary value on such forms of wealth not part of the market system? The simple answer is that it *can* place a price value on such forms of wealth not part of the market system, but it does not do it well (see Okun 1971:129-30). The advocates have a rare faith in numbers (Castles 1998:46).[246] The GPI, for instance, attaches monetary values to the non-market activities of unpaid work (e.g. household and volunteer labour). Hamilton (2003) critiques the indicator's separatism of 'unpaid labour' from paid labour (employment). He argues that both forms of labour are productive activities and both should be treated as purposeful and self-fulfilling activities, which have value beyond monetary assessments.[247] As Marilyn Waring (2009:174-5) shows, there is a loss of detail and specificity in policy analysis resulting from ascribing monetary values to labour (time). Thus, the argument against the relevance of price with the 'true' value of psychic income is an easy target for exposing *the* major weaknesses in SEWIs. Some advocates may judge this argument as unfair because of the assorted data problems and practical limitations involved with the construction of (any) empirical measure of net welfare. However, one is circumspect regarding practical limitations as the lone problem.[248]

---

[245] He poetically adds: "it is at the point of undertaking the calculation of net consumption—that is, net of all incidental goods and 'bads' that escape the price mechanism—that we cross the Rubicon, there to discover, as we press on, how tortuous and impenetrable is the welfare territory we seek to conquer" (Mishan 1994:171). Thus, the stronger and the more far-reaching are the consequences on citizens' welfare the less tangible and the less measurable they are likely to be.

[246] Mamalakis (1996) examines the conceptual, analytical and measurement issues associated with trying to link production, income and consumption, as defined by the *System of National Accounts*, to welfare, as perceived subjectively by members of a society.

[247] Despite his criticism, Hamilton (2003:60) believes that GPI is still good at challenging the Western world's growth fetishism.

[248] Of course, there are measurement problems. Lawn and Clarke (2006b:101-2) defend GPI: "the omission of crucial benefit and cost items is often attributable to the lack of available data sources

Critically absent from *every* SEWI analysis is a *systematic understanding of the political economy and system dynamics of capitalism*. Anitra Nelson (2001) for instance, argues that Marx presents value and price as cultural categories premeditated to secure production and exchange, reproduction and expanding accumulation of a particular form of social power. As far as monetary values and prices are attributed to human and nonhuman natures, they provide a one-dimensional and purely marketbased point of comparison that effaces other social and ecological qualities:

> The dominance of the exchange value dimension in a capitalist society encourages both alienation from nature and an instrumental view of nature. ... [Therefore,] [e]cological economists must question: whose interests price making serves; what prices represent; and why money and monetary evaluation are considered so useful and persuasive as a sign of ultimate worth. ... However they arise, prices are abstractions created by humans and presumably are intended to collectively represent patterns that ensure rational reproduction of an economic system. The pragmatic ecological economists' view that prices are just instruments to use to achieve desired outcomes fails to acknowledge that pricing and *monetary systems are so complex* that tinkering with individual prices in *ignorance of systematic interactions* invites unintended and undesirable (and even uncontrollable) consequences. [Nelson 503,504, emphases added]

Thus, the process of constructing an aggregated net-consumption index without scrutinising the monetary evaluations *in the context of a dynamic capitalist system* grossly downplays societal processes.[249] *Without* fundamentally understanding the social power relations that define the system's reproduction, applications of Net Welfare Indices are ineffective (H5).

6.7 The (Dis)embedding of Individual–Society in the Global, Regional and National Environment

Critical doubts are raised about the usefulness of the function of

required to make reliable monetary estimates of certain items"; and there are inadequate valuation methods available for capturing qualitative features of various good and services consumed. They realise that SEWIs overlook many welfare-related factors, e.g. disutility of work and existence values of natural capital, and ascertaining monetary estimates for some of the items involves a great deal of 'subjectivity'.

[249] Paul Burkett critically evaluates (with great specificity) the problem of monetization and marketization of nature (see Burkett 2006:chs.1-4).

Fisherian Income in SEWIs. Are not the services and disservices experienced (i.e. the net psychic income) flowing to the *individual* human being? Are the SEWI components beneficial to the household, society, or the individual? More specifically, are defensive expenditures a social or individual phenomenon? Is a separation necessary? The above reservations are important for the 'persons-in-community' framework as outlined by Daly and Cobb (1989).

It is important to study the dual nature of individual and social welfare. Clarke and Islam (2004, 2005a), authors of the Thai ISEW, examine *some* individual and social aspects in their social welfare function.[250] The social welfare function for the SEWI embodies relating social preference (or decisions) to the set of individual preferences. For example, corruption and commercial sex work may 'benefit' a few individuals, but the *social* welfare costs of these activities are real in terms of distributional justice, poverty, and intergenerational equity. In other words, an individual's choice can be in opposition to the social choice. "Social choice" is about relating social judgements to the views and interests of the individuals who make up the society. That is, individual preferences are not necessarily welfare (or utility) enhancing choices (see Clarke and Islam 2004:13). Thus, at least one of the SEWI theories makes a concerted effort to account for the relationship between individual and social welfare.

However taken as a whole, careful inspection of the SEWI studies divulges that authors have combined in a murky way the following general areas to construct the indicator: 'economic', 'individual', 'social', 'ecological', and 'sustainability'. Take for instance, *Redefining Progress*' perception on the issue: "GPI takes personal consumption spending by *individuals* on marketed goods and services as the starting point of welfare measurement, and assumes that an increase in this spending represents, ceteris paribus, a corresponding increase in welfare" (Anielski and Rowe 1999:15, emphasis added). For items of 'personal consumption', the consideration is on *individuals*, not the community. Also, crime is sometimes referred to as *private* (i.e. individual) defensive expenditures; other times it is a '*social* cost' or a proxy for 'social capital'. In other words, *most* of the SEWI studies mingle together individual and social costs/benefits.[251] It appears that there is no specific analysis of the relation between 'individual' and 'social' aspects and no awareness of the crucial dynamic interdependences between them (e.g. see Lawson 1989, 1997).

A crucial unanswered question arises, is psychic income or psychic

[250] As put forward in *Chapter 3*, the social welfare function integrates cost-benefit analysis with social choice theory, which incorporates various social concerns about welfare that are not adequately captured by individuals within the market place.

[251] Some notable exceptions to this tendency are Stockhammer *et al.* (1997) and Clarke and Islam (2004).

outgo "experienced" (Lawn and Sanders 1999:220) by the individual entity *or* society? Observing Irving Fisher's work reveals that he was chiefly interested in the *individual* and *their* net psychic income, not as much as the "social income". Hence, psychic income is an *individual experience* of the service in the *stream of one's consciousness* (see Fisher 1906:167,168). "A service rendered by an asset belonging to a given person is an event *desirable to that person* and occurring by means of the asset" (Fisher 1939:359, emphasis added). According to Tobin (2005a:211), Fisher was partly concerned with the so-called "social income" of the nation, albeit it simply consisted of adding together the subjective utilities of individuals. Thus, probably because of his solid background in general equilibrium theory (see Tobin 2005b:25-31), Fisher knew of no conceptual distinction between an individual's psychic income and the larger social whole (besides the obvious disparity in the summation). Similarly, there is no difference between individual and social psychic income in the SEWIs.

However, the distinction between methodological individualism and collectivism (Hodgson 2004, O'Neill 1973) and the study of agency and structure (Davis 2003) would certainly matter in the theoretical underpinning of a welfare measure based on the summing up of individuals' psychic income. Social economics, for instance, is based on the presumption that the economy is an extremely complex matrix of interactive behavioural variables. A system of such complexity should be conceived only as an organic whole and analysed only at the social level of generalisation. Yet, the welfare of an individual human being is a critical focus of social economists (e.g. see O'Boyle 2005). They are interested in the relationship between society and individual and the affirmative or negative impact of collective action on (and from) the individual (or person). On the other hand, Lawn and others have simply assumed away these complexities of individual and social phenomena by largely accepting that one can simply summate the psychic incomes of individuals to construct the nation's psychic income.[252]

Georgescu-Roegen (1971:284) points out that the act of consumption has a temporal dimension (i.e. a duration) but denies that temporal additivity of the psychic *flux* is possible.[253] But is the SEWI empirically relevant even supposing a pseudo-measure of collective psychic *income* is possible? Advocates have forgotten Veblen's (1908) critique of Fisher.

---

[252] Social economists emphasise that normative value judgements are necessary intellectual tools for any social scientist who aspires to be both empirically relevant and socially responsible. According to Hill (1990:157,158), social economists circumvent the alternative errors of preserving the bad or destroying the good. Their purpose is to preserve and perpetuate goodness and justice, but to eliminate and eradicate evil and injustice. Support for a normative social choice theory (à la Clarke and Islam) is strong. However, the argument centres on the aggregation of individualised 'psychic incomes'.

[253] The various individual psychic enjoyments *cannot* be "added together into a significant coordinate" (Georgescu-Roegen 1971:286).

Firstly, he argues Fisher has misconstrued the reality of incomplete property rights of immaterial 'capital' (intangible assets) in the conduct of modern affairs (Veblen 1908:116). Secondly, the redefinition of income as a hedonistic-taxonomic system of theory is problematic. "[E]conomic life in a modern community runs in terms of pecuniary, not of hedonistic magnitudes. ... In this light, the competitive struggle is seen to work out as, in effect, a friendly rivalry in the service of mankind at large, with an eye single to the greatest happiness of the greatest number" (Veblen 1908:120,124). The behaviour of an individual is not driven by a single, *simple* hedonistic mechanism.[254]

In *The Theory of Business Enterprise,* Veblen (1904:177) put forward a different meaning of economic welfare as "whether the community's work was adequate to supply the community's needs". He reasons that humans have innate constructive instincts, which, for instance, reach past one's own children to become a "concern for the life and comfort of the community at large, and particularly for the community's future welfare" (Veblen 1914:27). As argued in *The Engineers and the Price System* (1921), the community through its joint stock of knowledge was the source of value and growing production (not in the absentee owner). This implies a definition of the common good that "turns on the notion of sufficient output for the *entire* community and on an adequate portion of that output distributed to each member of the community" (Champlin and Knoedler 2002:878). Veblen saw the individual as embedded in society. "He ... is a coherent structure of propensities and habits which seek realisation and expression in an unfolding activity" (Veblen 1898:319). The essence of Veblen's enlightening works emphasised a holistic account of the service qualities from the stock of social capital.

Therefore, one is inclined to believe that Lawn and other advocates have lapsed on the *holistic method* (e.g. see O'Hara 2000), that is, the 'whole' (community welfare) is not only greater than the sum of the parts (an individual's psychic income), but that the parts are related in such a way that their functioning is conditioned by their relationship to each other.[255] Gunnar Myrdal well observed in *An American Dilemma* (1944) and *Asian Drama* (1968) the need for a concatenated theory with its various sections and subsections providing a multifarious, complex

[254] Even supposing hedonistic consumerism is the spirit of modern capitalism.

[255] It is important to point out that Phil Lawn probably does have a holistic understanding of ecological *and* socioeconomic issues (e.g. see Lawn 2006b:29-31). He converses on the degradation of moral capital induced by the market's individualistic ethos, and that the role of property in most contemporary societies serves as an instrument for the acquisition of pecuniary gain/exercise of power; problems that call for the re-embedding of community and the need for participatory democracy (e.g. see Lawn 2001:154,166,283,301-3). Also, Lawn (2008d:72,75) mentions in passing institutional decay and the need for a framework linked to *the GPI* (but not to GDP). In short, he covers a wide spectrum of policy issues in his many published works. But, his theory is limited when critically evaluating the SEWI from the perspective of creative-destructive processes of capitalism *and* integrating a strong socio-historical institutional analysis of the measure.

picture of the subject matter. He analysed "Negro race relations" as well as their well-being in the US, and found that to get to the root of the problem we must examine all interrelated factors (such as education, wages, health/nutrition, discrimination, stereotyping, cultural traits—and understand the interdependencies) in order to impede further rising ethnic inequalities. With *circular and cumulative causation*, there are tendencies for positive feedback changes in values to have a significant and non-linear impact on the system as a whole. Therefore, the relationship between the agent (individual) and structure (society) is one of complex interdependence, and one that needs to be addressed holistically by SEWI advocates.

Moreover, the majority of SEWIs are geared to the country of origin. Their analyses are good when examining the trade-off between natural and physical assets, but the problem is viewed in a national-centric fashion. All local systems (e.g. national, subnational) share the same planet, climate, air and water cycles. They are also part of the larger, increasingly globalised informational economy. Nonetheless, global system sustainability is not necessarily a product of sustainable parts, i.e. the whole is more than the sum of parts (the hierarchy of sustainable subsystems). Voinov and Farley (2007:109) argue that isolating certain subsystems and sustaining them in separation from the global system as a whole is futile and hardly feasible. This is particularly true if we attempt to sustain specific ecosystems along with economic growth. Local, national and regional goals and priorities may conflict with global ones.

Therefore, there is a need to transcend the purely national; because the nation is relatively autonomous yet interlinked with global, regional and local systems. The United States, for instance, currently the world's largest economic superpower, has a vast influence on Western (and Third World) growth and culture. The regional growth and profitability of the large US transnational corporations are imperative for the continuity and stability of the *whole* system. Only a perspective that examines the global system within a regional and (where relevant) national and local environments is appropriate to such problems. Understanding qualitative social and ecological changes of the system "begins ... by considering it as a whole, in its manifold manifestations and in its global impact" (Baran and Sweezy 1968:292). There is a need to go beyond (or explain) mere surface phenomena through recognising the complexity of the interactions and evolution. An analysis of tendencies, complexities and alternative geographic dynamics of the institutional fabric is a speciality of political economy (H5).

Often a first mover advantage and cultural modernity are better than the disadvantage of not making the first effort at change. In the global system, such rapid changes leave many nations comparatively backward as they struggle to keep up with the rest of the world. As O'Hara

(2006c:xviii) argues, *uneven development* is thus a necessary part of the motion, whether caused by colonial and imperial dislocation and oppression, the excessive pace of change, the hegemonic rules of the game, geographical and spatial factors, or a lack of social or human capital. Therefore, there are processes at work that help explain the relative success of the 'core' and the 'periphery' and the reinforcement of inequality between them (at many levels). The rate of growth of the core (advanced capitalist) nations tends to promote uneven patterns of income, productivity and quality of life.[256] The periphery lags behind as poverty, lack of human capital and inadequate investment generate underdevelopment. Subsequently, there are endemic system problems when only several regions belonging to the periphery grow and develop.

A characteristic of the disembedded economy is that the market system of capitalism primarily seeks to benefit from the exploitation of the stock of wealth (e.g. information, knowledge, and income). For example, vast forest areas are sacrificed in the periphery to produce fuel for the core. As non-renewable energy becomes scarcer, there will be more interest in producing biofuel. Oil from palm trees is a likely source. In Sumatra and Borneo, some 4 million hectares of forest have been converted to palm farms. Now a further 6 million hectares are scheduled for clearance in Malaysia, and 16.5 million in Indonesia (Monbiot 2005). Thus, the core utilise their economic-cultural advantages to exploit the periphery. This process penetrates all spheres of life, such as the individual, society, and the natural environment. However, the extent of penetration depends on the balance of the positive and negative forces working under capitalism. A suitable measure (or measures) of these forces is (are) thus required to present an alternative praxis to SEWIs. Are SEWIs part of the solution?

If SEWIs are to be useful then a crucial question arises for the advocates: What is the relationship between individual and society? In a structure–agency framework, the embedded individual is of central importance to heterodox economics.[257] John B. Davis (2003:111) writes, embedded individuals "are *acted upon by society*", but "are also themselves agents who *act upon and change society*". This means that an individual is simultaneously a product of society/culture and a producer of change in that culture. This individual is also self-reflective because they possess a capacity to act upon and influence social structures,

[256] Through economies of scale, learning-by-doing and a more optimistic state of expectations, the core can perform better in a global expansionary environment than the periphery (Ocampo 2005).

[257] Davis (2003) considers "the individual" as identifiable. The individual can be identified in two ways. It must be possible to identify a particular individual from among others; this is the *individuation* problem. Individuation concerns whether an individual can be identified as different and unique from other individuals. It must also be possible to track, and thus reidentify the individual over time and/or changes in any of the relevant variables; this is the *reidentification* problem. Reidentification is concerned with whether identified individuals can be reidentified after a change.

including language. As argued above in *Section 6.2*, real individuals may develop and change substantially, both in their character and in their fundamental tastes, whose actions can then in principle affect and change society.

A person is relatively autonomous yet also interdependent with others; s/he has personality (or 'individuality')—a unique individual mind, body and soul with a complex set of emotions, feelings, beliefs, loves. Individuality rests in identifying *with* others (i.e. in relationships) rather than distinguishing ourselves *from* others. Individuals, who as socially embedded beings, cannot be reduced to their group identities, and yet group identities impose significant constraints upon individuals. Individual identity is continually created and re-created in terms of external group associations. That is, as Hodgson (2004) argues, individuals and the nature of individuality might be *endogenous* to the economic process, since they are born into a world of pre-existing institutions, and institutions evolve as a consequence of the past actions of individuals.

It is critical to realise, especially for social welfare analysis, that individuals are to a degree independent agents, *but* often the scope of independent action is highly circumscribed. An individual in the affluent West can change for the better the practice of market activity through their interaction (e.g. as the demand for fair-trade commodities and organic foods shows). However, the more individualistic and disembedded s/he becomes, the less "individual" they really are. Hirsch (1976:106, emphasis added) suggests that "the market economy is institutionally focused on the wants of the individual *in his isolated capacity*". In a socioeconomic system where the market is the dominant institution, he finds that a tendency for a self-reinforcing interaction between individual private decisions and the expansion of the commercial sector, mediated by an erosion of nonmarket institutional arrangements and values. While individuals act upon the social structure when they evaluate their socially constituted first-order preferences, they are also acted upon by society in particular *when the market limits and constrains that evaluative capacity*.

The post-Fordist economy is increasingly relying on "subsistence labourers" (for instance). "These take up the low-skill, highly unregulated (if not illegal) and flexible jobs that form the underbelly of the glitzy new economy" (Migone 2007:189-90). They are the single mothers and the inner-city youths or the deskilled industrial workers of the US Rust Belt; in addition they are the illegal migrants in California agribusiness, the Chinese and Indonesian women who assemble clothing in North American sweatshops, the Asian caregivers and maids, and the flood of sextrade workers from Asian and Eastern European countries. These individuals are not able to "freely" choose the groups to which they

belong—this means "most individuals over time lose or never develop this capacity, and are consequently not reidentifiable as distinct individuals across change" (Davis 2003:157).

For example, the apparel industry is a good illustration of the need for deeper reflection on the individual–society in the global and regional system. A study of the apparel industry is vital because it is one of the world's largest manufacturing industries and is among a handful of industries where extreme exploitation of vulnerable labour is central to the labour process and to the chain of profit making. A combination of political, economic, and social trends has come together to create working conditions that are abominable, and it is chiefly apparent in the apparel industry (see Ross 2004:20,21,23,178). Sweatshops in the United States, for instance, violate multiple employment standards as laid down in the US Fair Labor Standards Act (Rosen 2002:226). Also, in China's export factories, often the labouring hours are in excess of eighty hours, workers toil in forbidding and hazardous compounds, and union rights are nonexistent—the laws are fine but enforcement scant (e.g. Chan and Wang 2004/2005, Ridder 2006). Clearly, sweatshops are seriously distressing examples of what Fisher (1906:174, 1937:34) referred to as the 'psychic outgo', the undesirable subjective efforts put forth by human beings in order that non-conspicuous satisfactions derived from clothing may accrue.

Nowadays, individuals in Western nations are receiving psychic incomes from clothing capital more than they could in the past because they can buy more items of clothing at a lower cost per item.[258] Consequently, an individual in the affluent West may enjoy the psychic income from clothing apparel imported from any of these areas, but not endure the psychic outgo experienced (e.g. the mental stress associated with sweatshop conditions). The price paid ignores the sweatshop conditions (which the system inherently supports). Yet, the moral and social implications of the generation of services and disservices are significant in a measure of sustainable well-being. It must be deciphered under what conditions *who* receives the service, because of moral or institutional constraints. A political economist cannot simply consider the service flowing from a commodity *without interpreting the social or moral consequences of the exchange*.[259] These are crucial considerations

[258] For instance, American families today are paying less (in real terms) for clothing than they were twenty-five years ago (Rosen 2002:231). Low apparel prices (and higher profits for retailers) are obtained because trade liberalisation and competitive pressures to find ever-cheaper pools of labour lowers costs of production. Subsequently, Western retailers source in places like China, Bangladesh (Roddick 2004:23-7), or Haiti (Ross 2004:37).

[259] The key here is for the political economist to employ a research design that is participatory rather than distanced. The main argument by Sabine O'Hara is that the selection of indicator categories and the evaluation of trade-offs between them must be flexible enough to allow for context specific conditions and variations (see O'Hara 2009:186-91). "Non-credentialled experts",

for calculating SEWIs. Traditionally, the SEWIs have not accounted for these non-ecological cross-boundary or intra-peripheral influences on the net psychic income of an area.

Lawn and Sanders (1999) assume and/or accept that the net value of services and disservices is equal to *net psychic income*. That is, 'psychic income' is also known as 'service' in their analyses.[260] Because agents possess imperfect information, we need to ask whether there should be a distinction between the individual evaluation of 'psychic income' and the socially evaluated 'service', likewise, 'psychic outgo' and 'disservice'? If there is real distinction, then individual well-being may increase, but the net welfare of society may decrease. Continuing with our sweatshop example, the service (social welfare) would be lower because of the unjust labour conditions, even supposing the 'psychic income' of an individual (who purchased and wears the apparel) increases. Thus, there is a contradiction between individual and society, where the interests of the individual are satisfied at the expense of social well-being.

Furthermore, the psychic outgo experienced from sweatshop conditions is unevenly distributed among people of a particular ethnicity, gender and class. US sweatshops primarily employ women without sufficient education, or women immigrants, both legal and illegal, who lack language skills (Ross 2004:35). Pay is very low and even when minimum wage standards are met, the level of earnings seldom allows for a satisfactory standard of living, because genuine living costs require higher daily wage earnings. "Americans have yet to see the link between the growth of apparel sweatshops and domestic retailing, which has generated a *new group of low-wage women workers* in the United States" (Rosen 2002:235, emphasis added). The consequence of a combination of low individual, social and structural capacities will be passive, underprivileged classes who have low incomes and little control over their destinies, denying them (low-wage women) full participation in society.[261] In relation to hypothesis H5, understanding the political economy of capitalism entails a study of the individual–society contradiction, but it is hard to link all the evaluation problems of individual and social welfare in one national-centric index.

In conclusion, to belong to a certain group is to play an informal role (whether or not one wishes to) and experience its advantages and

---

in this case, the marginalised sweatshop workers, are (to a degree) quite capable of articulating their own standpoint (the problems they face).

[260] For example, regarding the annual services yielded by the stock of consumer durables: "the value of the *services (psychic income)* derived from their part 'consumption'" (Lawn and Sanders 1999:220, emphasis added).

[261] Our discussion rightly focuses on real-time spatial scale implications of individual versus group identities, which were missing from the vast majority of the aggregate indices of ISEW and GPI. Yet, illustrating the value-feedbacks and tensions between individual and group and society in more rigorous depth would require a similar application to intergenerational equity (i.e. examining the current *and* future welfare effects).

drawbacks. In Veblen's holistic vision of the 'individual', social relationships are embedded in individuals rather than individuals being embedded in social (group) relations. "If individuals are so heavily influenced by group membership, individuation is difficult without freedom of movement between groups. *Such a lack of freedom exists under [disembedded] capitalism* and frustration about it can be seen in Veblen's writings" (Wunder 2007:834, emphasis added). The lack of mobility between groups may actually result in the retardation of individuation. Only through free association can individuation be achieved. Yet, as Timothy Wunder (2007:834) points out, "the fact that individuals rarely have the choice of free association means that individuation may never form in the first place".[262] Some important questions arise. How would we measure the net welfare of different groups in a SEWI? Can SEWIs adequately measure the net welfare of groups? These types of issues need further investigation, especially in relation to the *asymmetric distribution of welfare to heterogeneous agents*, now discussed in *Section 6.8* below:

6.8 The Imperceptibility of Heterogeneous Agents and their Asymmetric Distribution of Power/Resources

A part of the problem is that composite indices such as the SEWIs, only present information in a form that is more expedient, more understandable, and more amenable to some forms of analysis. "But in the process, much useful information may be lost. *This loss should be weighed against the gain from avoidance of the trouble of handling a large set of data*" (Chakraborty 2002:1199, emphases added). When looking at inequality (for instance), Chakraborty (2001, 2002) argues that it would be more meaningful to examine inequality among socio-demographic groups, like gender disparity or rural–urban disparity as opposed to inequality across individuals, such as with Gini indices.[263] In relation to inequality in non-distributable conditions, such as health or knowledge and skills, of which it is not possible to transfer units between persons, Chakraborty explains that the analysis becomes more meaningful when we study inequality *between groups* rather than between individuals.[264] However, the SEWI tends to aggregate income inequality aspects for the population as a whole and in doing so treats people as *individuals* rather than also as groups of people, e.g. an average is calculated. What is more meaningful in net welfare analysis is to examine the heterogeneity of

[262] However, Jackson (2005) demonstrates that conflicts between agency and structure will affect certain individuals and groups but will not be spread throughout the whole population.

[263] However, if inequality is large, the Gini potentially tells us that there are classes—from which we could explain them in more detail.

[264] To study the distribution of physical disabilities, for instance, over the population at large has sparse meaning. "[I]t would be more meaningful if we could show that physical disability on average and net of age differences varies between social classes" (Chakraborty 2002:1201).

agents.

When assessing the complexity of class, gender and ethnic well-being, and species, the *control* of more durable and secure sources of capital stocks becomes vital. Fisher (1906:117) says that useful services are often derived from a person who *owns* the capital stock. Ownership may be necessary to enjoy the service for certain types of artefact capital, which may enable one to experience other, more durable kinds of capital.[265] Control or ownership of the wealth, rather than money income *per se* is a significant variable for equity and distribution considerations among *heterogeneous agents*.

According to O'Hara (2007b), the principle of heterogeneous agents (or people) states that:

> there are multiple roles played by agents in the [systematic circuit of social capital], due to asymmetric distribution of power and resources. Individual preferences and resources are affected by their institutional, cultural and biological environmental, including genetical makeup and family background, occupational and income status, ethnic and class positions, as well as gender disposition. These multiple roles are also affected by corporate, media and party-political institutions. Individuals do not exist as an island, but interact and are affected by other individuals, friends, family, groups, organizations and systems of belief and valuation. In this system of influences, class, ethnicity, gender and species are critical. [O'Hara 2007:13]

To the extent that behaviours are learned, they are transmitted by culture and society through our families and social groups, e.g. when we are young, we learn from our parents and caregivers. A person's place within social structures determines their ability to act: personal relations and networks that diminish those of non-members magnify the powers of network members. This is because of the asymmetric distribution of power and resources to heterogeneous agents.

The sub-hypothesis, H5.2, is also raised:

H5.2: Composite net income indicators inadequately measure distribution.

One's class, ethnicity and gender shadow family background, as the resources offered by families, friends and relations necessarily shadow

[265] The service may be privately enjoyed from *un*owned forms of wealth, for instance, if the nature of the capital stock is a public or social good (e.g. the ocean or government infrastructure) or is not normally owned as such (e.g. the stock of trust).

the value of parental guidance, school attendance and occupation. The ability of parents to influence the intergenerational transfer of resources to their offspring is a crucial determinant of the material and cultural advantages they will bring to bear on the future (Bourdieu 1997). High levels of education among the community and key job and economic connections (social linkages) are common for people from families with more privileged backgrounds (Bourdieu 1997, Bourdieu and Passeron 1977). Hence, merely summating the psychic income of individuals in an index would therefore trivialise important distributional problems in the market economy. Hypothesis H5.2 says that we need to scrutinise the moral and social implications of the generation of services/disservices. This is because welfare may be unevenly distributed amongst people of a particular class, ethnicity and/or gender. SEWIs are restricted to an *impartial* measure of these problems.

The composite indicator presents the observer with limited information concerning heterogeneous agents. Nonetheless, advocates do consider 'groups' to some extent as the SEWI takes the effects of inequality of income amongst the distribution of the 'lowest quintile' in total income (e.g. US ISEW, Daly and Cobb 1989) as well as the welfare costs associated with long-term unemployed people, problem gamblers (e.g. Australian GPI, Hamilton and Denniss 2001) and prostitutes (Thai ISEW, Clarke and Islam 2004) when addressing net welfare. But, Costanza's *et al*. (2004) study into subnational GPIs, for instance, offer only criticism of measurement problems, and no attention is paid to the fact that the heterogeneity of a population is not limited to geographical units. Overall, however, *explicitly* accounting for the control of wealth amongst heterogeneous people is not embedded enough in the SEWI framework: rather the focus is on the monetary welfare *across individuals*. That is, there is no *explicit* class, gender or ethnic analysis of the asymmetric distribution of psychic income and outgo in the net welfare indices: for example, noise, air or water pollution or crime. It would be more meaningful and useful if there were a more detailed component analysis of the various dimensions of societal welfare because of the inherent limitations of single-money composite index (H5.2).

To illustrate, consider a private (residential) rental situation. Under Fisher's logic, the persons' renting receive useful services from the house (e.g. shelter). The owner of the rental property only gains the flow of 'money income' (if they are saved)—unless, of course, the rental money funds are immediately utilised for consumption spending (i.e. not saved) then the owner may gain useful psychic income services. For Fisher, if the rental funds are saved or stored then the situation is different, because the accumulation of money income as savings is not to be included under current 'psychic income'. Capital goods and monetary income saved 'yield' no present service; savings only represent *control*

over future services that will/may later arise. To apply Fisher's argument (a static i.e. deterministic analysis): money and interest made from variously owned capital stocks (e.g. property 'investments') can only be a potential quality of the service, which is yielded/experienced only when a useful service is obtained by the owner.

However, in reality, Fisher's version of current service and savings has some limitations vis-à-vis heterogeneous agents. Because, people who own more property than others (e.g. the affluent bourgeoisie) are, in effect, limiting the distribution of the higher flow quality of the psychic income to people who do not own property (e.g. the working poor).[266] Owning a house frees the owner from the obligation of paying rent, leaving more resources for spending on other needs. For instance, upper-class people who can afford the ownership of housing capital may enjoy a higher level of psychic income than the lower-class tenants, because of the higher level of present and future security—'locking in' the service yielded.[267] Rather than adjusting SEWIs by the Gini coefficient, it *might* be more useful to have a wealth-adjusted income measure instead. Wolff and Zacharias (2007) find that (in the US, 1983–2001) 'wealth inequality' is far more severe than income inequality and this has consequences for economic security. Certainly, in the multiple capital paradigm (MCP), the upper-classes have greater access (for *current* well-being) and privilege (security for *future* well-being) to highly durable forms of social, human and artefact capital (see Bankston III and Zhou 2002, Lareau 2002).

The analysis above challenges Neumayer's (2004) argument, viz: "Contrary to well-being itself, which has an orientation towards the present, sustainability is a future-oriented concept. ... [C]urrent well-being is affected by the way in which current total capital is used. Sustainability is only affected if the total capital stock itself is affected" (Neumayer 2004:1,4). He suggests that intra- and inter-generational distribution can conflict with each other; e.g. there is a poor link between income distribution and sustainability. But Neumayer's major point is questionable because providing resources to lower classes can increase their potential inclusion in society (i.e. *enhancing their future welfare*). The growth and development experiences in East Asia (especially, China), Latin America and Sub-Saharan Africa (SSA) demonstrate that the distribution of 'welfare' and its 'social sustainability' are interrelated.

China's reform of rural and agricultural institutions that had begun in the late 1970s laid the foundation for its current economic and health

[266] Therefore, social safeguarding of the stock becomes important (such as increasing the role of protection by a democratic state).

[267] While 'savings' according to Fisher do not yield psychic income, they are a function of the control of wealth and hence have the potential to yield income. Nonetheless, not all of the psychic income is derived from artefact capital; hence, the upper classes may not enjoy an overall net psychic 'advantage' over other classes.

achievements (UNDESA 2006:46,135). Designed with a pragmatic vision, institutional reform in China has laid down long-term economic development as the ultimate goal, *but ensuring that the resulting economic affluence is shared by a growing number of recipients*. Despite some social and economic volatility and rising urban–rural inequality since 1995, its economic achievement has lifted tens of millions of people out of extreme poverty in the last two decades—in comparison to the little progress of poverty reduction for 99 countries (93% of the population in low- and middle-income nations) (see Chen and Ravallion 2007:4). The Chinese experience confirms that during 1980–2007 the social redistribution of capitals (particularly land) has led to *sustainable* gains in economic welfare.

Sustained poverty reduction (in the 'relative' and 'weak absolute' sense) depends on a fast pace of GDP growth together with social structural reforms. The failure to build up various capitals explains (in part) why Latin America and SSA (excluding South Africa) have fallen behind the East Asian countries during the 1980s, 1990s and 2000s—these Asian economies invested more in the quality and coverage of infrastructure (machinery, equipment) and in human (education, health) capital (Arias 2006:167-8).[268] The scourge of malnutrition and inequality hinders children's physical, mental and social development with life-long harming effects (UNESC 2008). Evidently, a persistent uneven distribution of the stock of wealth and income has reduced current and future levels of social welfare in SSA (and the periphery in general). Hence, contrary to Neumayer's position, it is argued—and the empirical evidence confirms it—that there is a strong relationship between income distribution and sustainability.

A common problem to all areas (regions or nations) is that the psychic outgo may be unevenly distributed towards poorer people because of, say, their class, which limits their ownership of and their power over wealth.[269] Research provides support for the linkage of people on low incomes with exposure to chronic noise and overcrowding (e.g. see Ulrich 2002). For instance, low-income children are on average more

[268] Although rates of primary and secondary education are up in many Latin American countries, the *quality* of education is appalling (and only modest improvement at the tertiary level)—"probably the single most important source of Latin America's lagging economic competitiveness", as Francis Fukuyama (2007) remarks. However, there is a great deal of social change brewing under the surface as a result of reformist left-of-centre democratic leaders across Latin America since 2003—part of a new development agenda that is still in the making. The main message of this study is how imperative and sustainable these domestic measures of social policy really are *vis-à-vis future socioeconomic welfare*—i.e. in the form of early land reform and heavy investments in basic education was to East Asia's success.

[269] Class as an economic concept is an entry point and focus in political economy. 'Class' is *one* particular social process *among the many* that comprise social life—hence, 'class' is no less determinant of social life than any other aspect (Resnick and Wolff 1987:25,87). Class analysis is important for the capitalist system, because of the conflict between the interests of capital owners and the common good, where the 'common good' of sustainable well-being should prevail.

vulnerable than middle-income children to adopting learned helplessness. In addition, utilising national household survey statistics, Evans and Kantrowitz (2002) find that households in major US metropolitan areas with household incomes below $10,000 had average levels of sound exposure about 10 decibels higher than households with incomes above $20,000. Low-income residents in these urban neighbourhoods also reported "neighborhood noise as bothersome" nearly twice as often as families not living in poverty. And, noise pollution research also indicates the link between residential crowding and low income (e.g. see Evans and Kantrowitz 2002). Households with fewer rooms in low-income neighbourhoods in the United States, Mexico, and England had considerably less access to a park or a private garden—poorer people do not experience vital 'psychic' services from infrastructure and ecological capital. And clearly in the above noise pollution example, their level of health would be relatively lower.

In other words, the intensity of the psychic income or service experienced by less-privileged people is relatively lower because an inferior, insecure and less-durable stock of capital is rented/owned. Human needs (and wants) are satisfied by the existing capital stock, but not by the unavoidable but regrettable characteristic of the stock to become worn out or all used up. Human welfare is not a function of consumption *per se*, but of the capital stocks—yet the control *and* power of the durable wealth may be unevenly distributed which potentially privileges particular groups in society. In *some* respects, use of Gini or Atkinson index or analysis of the lowest 10% decile in SEWIs alludes to the distribution of sustainable welfare between classes over time. However, only a few authors of SEWIs have considered specific distributional effects. For instance, Stockhammer *et al.* (1997) regard welfare as a social phenomenon and adjust their raw-ISEW for Austria by an income-and-work distribution index (see Stockhammer *et al.* 1997:25,30). Overall, however, a lack of inter-group analysis *vis-à-vis* the aggregated composite indicators by advocates grossly oversimplifies reality.

Several advocates provide a good socio-historical institutional analysis of heterogeneous agents and their role in the social economy. For instance, Cobb *et al.* (1999:36) examine the emotional problems faced by the modern youth of America, i.e. *children* on drugs, heavy drinking, smoking and mood-altering substances. However, their GPI does not break down the allotment in which heterogeneous people (in this case, the children) are affected. They have not excluded any of these items from the 'personal consumption expenditure' column in their US GPI. The GPI authors have raised valid critiques against GDP, but how does one judge the claims above, professed under "Column A, personal consumption expenditures", in the overall index? Yet as argued in

Chapter 4, they inadvertently show the limitations of constructing an all-in-one indicator of "genuine progress": the authors had a far superior disaggregated account of real socioeconomic institutions to their aggregated inquiry. In other words, pivotal limits of monetary-composite indices concerning the heterogeneity character of *persons*-in-community have been self-exposed (H5.2).

Then again, some of the SEWIs indirectly detect the *contradiction between heterogeneous species*, e.g. between human beings and non-humans. Lawn, for instance, separates (a) socioeconomic and environmental effects on 'human welfare' from (b) the negative socioeconomic effects on the 'natural environment'.[270] There has been an overt separation between the (a) socioeconomic effects on ecological capital influencing the human-welfare of the household, and (b) socioeconomic effects on ecological capital degrading the natural environment as such. The first case, (a), is primarily a human—environment—human-welfare interaction problem, and the second case, (b), is a human—environment—environmental-welfare interaction problem. Yet, ultimately, the SEWIs are measures of human welfare, not environmental welfare. Thus, the cost of the lost source, sink, and life-support services provided by ecological capital is from the perspective of maintaining the *human* habitability of the planet.

However, Lawn acknowledges that SEWIs do not account for the existence value of ecological capital. In his definition of sustainable development: there is a need to recognise the intrinsic value of sentient non-human beings and extend the principle of justice to include the dignified and, where plausible, cruelty-free treatment of sentient non-human beings. Rights could accrue to creatures other than ourselves that, if supported, limit humankind's share of the planet. Lawn (2007a:28) possesses a biocentric view of the world. He believes that humankind knows enough about the value of biodiversity (e.g. diminution begets further diminutions) to operate on the (precautionary) principle that all reductions in biodiversity must be avoided, because of the potential threats to ecosystem functioning and its life-support role for *all* species. Therefore, in principle, Lawn's SNBI accounts for non-human species (with the adjustment of an ecosystem health index), but does so indirectly.

On the other hand, it is hard to imagine that a monetary-based SEWI could manage the complexity of heterogeneous species by summating the totality of biodiversity destruction via a simple index. Relating to hypothesis H5.2, SEWI aggregates ignore distribution of power *between species*. The same arguments put forward for the diverse human groups

[270] This distinction between 'human' and 'ecological' welfare affects is clearer in Eq. (5.36) (*Chapter 5*)—where the SNBI is divided into 'net psychic income' and 'depletion of ecological capital' accounts.

above *could* be transferred to the role of individual or groups of non-human species (so finely interconnected in the web of life). It would be more meaningful and useful if there were a more detailed component analysis of the various dimensions of ecological welfare (e.g. see Hajkowicz 2006, Munda 2005, O'Connor *et al.* 1996), because of the inherent limitations of the monetised composite index. Of course, we would have more faith in the SEWIs if they were not fraught with conceptual problems, and they were more complete in multiple contradictory analysis.

6.9 Conclusion. Beyond the Veil of Constructing SEWIs—*Radical Theoretical Reconstruction Needed*

The Index of Sustainable Economic Welfare (ISEW), Genuine Progress Indicator (GPI), Sustainable Net Benefit Index (SNBI) and Fisherian Income (YF) are no saviours for GDP-adjusted indices because of the lack of a strong theoretical framework and socio-historical institutional analysis—a *linked* systems view of the social and ecological conditions in the disembedded economy is missing. In *Sections 6.2–6.8*, it is argued that various over-simplified assumptions are employed, particularly regarding the metamorphosis of human and social capitals vis-à-vis psychic income; the connotative acceptance of monetary evaluation as a solitary good measure of 'optimal net welfare'; the ignorance of heterogeneous agents; and the implicit acceptance of personal consumption as the reference point of well-being. Overall, ad-hoc commonsensical accountancy from a nation-centric perspective prevails. The correctness of measuring sustainable economic welfare is unconvincing because SEWI advocates have not adequately detailed the theoretical fundamentals of 'psychic income generation' over real historical time—the very nature of personal and social development processes is qualitative in nature and furthermore cannot simply be summarised in monetary terms. Thus, I argue that the aggregated national (or subnational) indicators do not get to the heart of solving real issues (vis-à-vis H5, H5.1, H5.2), because there is an inadequate understanding of the political economy system.

E. J. Mishan (1994) was the first, of a handful of authors, to assert that the SEWI was probably a foredoomed project. Still, one has the impression that his astuteness is ancient history, i.e. there is general acceptance that the SEWIs *are workable*, with good prospects. The wounds Mishan once inflicted to the 'net consumption' indicator are now healed; also, complete immunity from Eric Neumayer's (1999) virulent blow looks certain. For instance, in *Indicators for Sustainable Development*, Richard England (2006:218, emphasis added) states: "[f]rom the standpoint of research strategy, it is preferable that ecological economists *refine their measurements* of ... ISEW". Thus, the labyrinth of

the social-biospherical reality is reduced to "refin[ing] their [ad-hoc commonsensical techniques]".

Of course, advocates of SEWIs point out that their measures are far from perfect, and never once did they explicitly believe they were in any case. Yet, they must consider it necessarily important to go through with the statistical calculations. Clarke (2006b:181) and Clarke and Lawn (2008:575) regard the whole exercise as a fruitful process despite its imperfections in terms of adjustments, methodologies and value judgements: "whilst the seriousness of [these] weakness[es] should not be underestimated, it is not enough to condemn the [ISEW or GPI] to redundancy". Thus, we need to consider the imperfect areas of recognised incomplete and narrowly defined sustainable development indicators within SEWIs. *Au fond*, the advocates have concentrated on the shallower imperfections associated with their arithmetical operations. The emerging debate surrounding SEWIs still appears saturated in so-called methodological (i.e. measurement or 'construction') limitations, not the theoretical underpinning. This chapter argues that advocates did not adequately undertake a self-critical analysis of their SEWIs.

The measures are imperfect in so many other ways. The SEWIs were problematic to begin with because of a limited ontology of 'wealth'. This constricted view leads to the destruction of critical forms of wealth, particularly human-health and social capital, as they are abstracted from the analysis. When drawing inference from everyday social interactions and personal experiences in a community—e.g. the time, risk and expenditure invested by many people in endeavours to discover another human being who is willing to show love, tenderness, understanding, consideration and sympathy—such types of personal services are valued very highly on the scale of welfare. Paradoxically, the SEWIs cannot be developed or improved any further to incorporate such services, and thus, because of the misplaced concreteness of money and the prominence of consumption, by no means can realise their full potential. It is now axiomatic that an 'economics for community' framework, developed by the authors of the original ISEW (Daly and Cobb 1989), cannot be integrated into the measure. There are major limits to the monetary composite indices. *It is necessary to transcend the one-and-a-half contradiction world and have a broad view of wealth*.

Ultimately, there was blindness to the *social* (and moral) consequence of market institutions in SEWIs; a deficient multi-criteria analysis of the contradictions of capitalism's creative-destructive processes was a lack of judgement on the advocate's behalf. In the disembedded economy, due to obsolescence, the hurried pace of technical change, and the wider range of options available, *consumption upholds net social and community welfare loss*. This is because the market extends to all facets of social life. Life outside of business life (corporations and markets) is dismantled by

the incessant transformation and disarrangement of free market capitalism—i.e. market transactions increase at the expense of reciprocity and redistribution. Hence, the extensiveness of market exchange, combined with increasing intensity of material consumption, has occurred at the expense of intensity in human relationships. Moreover, it is argued that displacing the multiple contradictions in the analysis of sustainable well-being is *theoretically incongruous with the reality of social life in a market-dominated economy*.

In conclusion, the majority of the SEWI studies act in a syncretic fashion and trivialise the realities. The way SEWIs are calculated is a highly sensitive operational procedure due to summarising the complexity of the system in, what Mishan (1994) labelled, the "grand computation". The use of any single composite indicator to describe and perceive the subtle patterns of the total socio-ecological system is very difficult. In his devastating critique of orthodox economics in "The Irrelevance of Equilibrium Economics", Nicholas Kaldor's analysis could well apply to the literature on SEWIs:

> The process of removing the "scaffolding," as the saying goes,—in other words of relaxing the unreal basic assumptions—has not yet started. Indeed, the scaffolding gets thicker and more impenetrable with every successive reformulation of the ['']theory['], with *growing uncertainty as to whether there is a solid building underneath*. [Kaldor 1972:1239, emphasis added]

Advocates became excited about the prospect of debasing GDP from the socio-political spectrum, but alas, this was executed in an ill-conceived, innocent and hasty manner. There was simply not enough energy put into the "solid building underneath" and unification in the SEWIs, and hence, "further indicator supplementation for the ISEW, GPI or SNBI" (Lawn 2006a:162) would not be useful. This is because of the soft theoretical base—no conceptual specifications on the interconnected realms of wealth, service, psychic-income, sustainable well-being for the individual, society, and community were known. The measures come crashing down once one establishes the major conceptual, empirical and technical defects.

Therefore, it is doubtful that SEWIs are describing and measuring accurately social and ecological change, because significant conceptual, methodological, and technical inconsistencies mar the results. The *raw* ecological economistic approach limits the study. There is a need to transcend it. A more detailed and broader approach to net welfare is needed to find the root of social and environmental problems. As a point of departure, it is suggested that it is best to have a social and ecological

political economy approach—only a perspective that examines the global system within a regional and (where relevant) national and local environment is appropriate to such problems. Political economy is well positioned to handle the processes of social and ecological change, accepts the principle of holism, and thus realises that a detailed socio-historical institutional analysis is needed. *Chapter 7* concludes this study, proposing that further study of an alternative measure anchored in the political economy of the disembedded system is a (partial) solution to the research problem.

Chapter 7.
Conclusion

This study has critically evaluated six socioeconomic and environmental indicators, which were introduced in *Chapter 1*: Measure of Economic Welfare (MEW), Economic Aspects of Welfare (EAW), Index of Sustainable Economic Welfare (ISEW), Genuine Progress Indicator (GPI), the Sustainable Net Benefits Index (SNBI) and Fisherian Income (YF). Following in the footsteps of Nordhaus and Tobin (1972) and Zolotas (1981), Daly and Cobb (1989) in their landmark book, *For the Common Good*, pioneered early work into developing the earliest measure of net welfare to include distribution, defensive costs, and sustainability (e.g. the costs of long-term environmental damage) in the one index. GPI, SNBI, YF and further ISEW studies have subsequently followed suit. Collectively, these composite measures may be referred to as 'Net Income Indices' or Sustainable Economic Welfare Indicators (SEWIs) since they are designed for assessing aspects of *sustainability* and *welfare*. Commencing in 1972 and ending in April 2009, there have been forty-five individual studies involving construction of a SEWI at the national, subnational and local levels. Subject to data availability, each analyst has obtained estimates of the variables required to compute their indicator for the nation/place of interest, utilising multiple sources such as government reports and the System of National Accounts. Overall, SEWI advocates attempt to demonstrate the limitations of Gross Domestic Product (GDP) by devising a single composite measure of the positive and negative contributions of economic activity to sustainable well-being.

No author in the literature has undertaken a meticulous study of each work for the SEWIs from the perspective of political economy. The task of political economy is to continue exploring the modus operandi of capitalism with a view to ascertaining the changing forms in which the system manifests itself. The market extends to all facets of social life; life outside of business life is dismantled by the incessant transformation and disarrangement of free market capitalism. The implication is that for any study into sustainable well-being *the key focus is the effects of market institutions on society*. Having embarked on a systematic, detailed and scholarly examination of the conclusions drawn in the literature, our findings in relation to the hypotheses raised in *Chapters 2–6* are now summarised below.

Chapter 2 gave a historical overview of accounting for income and welfare. This inquiry was guided by hypothesis one, H1, *that economic growth provides a good measure of wealth and welfare*. H1 is valid to some extent, since we found that economic growth or levels of income (GDP) have historically been good concepts for understanding (changes in) net

welfare. Economic growth was understood by some of the founders of accounting, such as Irving Fisher and Simon Kuznets, *as a sustained increase in its magnitude of services over a long-term trend*. But a dilemma is that in practice it is very difficult to make the idea of 'service' (welfare) operational in a system of income and product accounts. Some compromises were made. Coinciding with the development of the 1953 *United Nations System of National Accounts* (UNSNA), 'economic growth' no longer stands for a measure of 'net income' (genuine welfare of society). Because a 'business' worldview was enshrined in UNSNA, "economic growth" chiefly signifies market-based production activities. Hence, the narrowly defined measure of 'production', Gross Domestic 'Product' (GDP), was born and to this day remains the principal indicator of economic performance for developed and developing regions of the world. GDP is simply a measure of the final value of *marketed* goods and services produced.

There is *a plus* side to this route—yet commonly overlooked in the literature on SEWIs—because GDP growth is useful for comprehending the rate of expansion of market relationships. In this thesis, it is argued that *historical trends of GDP provide a good understanding of the workings of the capitalist system*. Gaining insight from Marx, Veblen, Keynes and Schumpeter, we learn that a critical evaluation of GDP from a systems perspective is critical. The great four political economists saw the system as being potentially unstable, with recession (or depression) as likely as sustained periods of GDP growth. Capitalist institutions include production only for market exchange, a monetary economy, and production motivated mainly by profit. All of these institutions make possible the business cycle—because if there is insufficient monetary demand to buy the supply at a price including a profit a contraction may occur. GDP growth must therefore be scrutinised in the context of the cyclical movements and long waves by having a detailed historical analysis, from which we can gain a reasonably good insight into (changes in) net welfare (H1).

However, there are many unresolved socio-ecological problems with GDP, which make the stronger overall case for rejecting H1. It is true that the negatives of GDP have been evaluated in the literature to a considerable extent. Yet the inquiry into this issue is indispensible since it provided the context of determining the extent to which the SEWI advocates contend with these factors in their replacement GDP-type measures. Six limitations (three social, three ecological) that make GDP a weak indicator of net welfare were recognised. *The operation of GDP concepts in practice generates social problems, especially in relation to consumption*. Conspicuous consumption, waste and fashion are not specifically identified in GDP accounting—and thereby it is difficult to ascertain its net welfare effects on society. Under the existing

institutional arrangement and the rise of individualism, particularly in the West, empirical evidence suggests that the durability of social, cultural, familial and community capitals is being destroyed by GDP growth. GDP also excludes the durability of artefact/consumer capital; therefore maximising economic growth in the consumption (destruction) or production (creation) sense provides no indication of the enhancement or deterioration of real wealth and welfare.

Singly, GDP provides little indication of any ecological barriers or limitations under capitalism. As prominent social-ecological economists Kenneth Boulding and Herman Daly attest, GDP does not differentiate between growth (quantity of the service and disservice) and sustainable development (quality of the service), and leaves out ecological capital depletion. The current economic accounts implicitly encourage over-consumption, since the welfare-orientated variables of 'service' and 'disservice' are not explicated in the newer system of green accounts (SEEA-2003). That is, "economic growth" in the greener accounting system is still narrowly defined as real GDP growth, *not* sustainable development, green GDP or net income. *The heart of the problem is when GDP becomes a single indicator obsession*. Ultimately, GDP *may* need to be modified as it provides an inadequate measure of social and environmental waste in the economic system—H1 is therefore rejected. It is at this point of the study we entered into the territory of net income indicators, which entails devising a method of accounting for the costs and benefits of economic growth.

It is useful to see through the lens of those committed to developing and processing these GDP-adjusted indicators of sustainable economic welfare. In order to rectify some of the shortcomings of GDP, they argue that it is important to combine the benefits and costs of market and non-market activity into a single monetary-based account, so that net welfare effects can be ascertained. Their *conceptual* argument is founded on the premise that there would be no tendency to use GDP as a surrogate measure of economic welfare if an alternative were developed to perform that function more adequately than GDP. The main thread of their *empirical* argument is that a comparative analysis of the historical trends between GDP and SEWI is fruitful in demonstrating the weakness of economic growth as a measure of wealth and welfare (the inverse of H1). The sympathetic view of their *technical* cause is a simple human truth: the world's complexity engulfs us if we have no clear, simple goals. This is especially valid with respect to the natural environment. There are multiple issues to track and too many contending targets. Accounting is a proven tool for dealing with this quandary: it helps us distil complicated factors into a few principles on which we can focus.

Good measures can offer vital insights where there may be conflict between the various spheres of economy, society and ecology. If SEWI is

to be a meaningful indicator, a solid conceptual foundation that describes the prevailing socioeconomic system is essential. In *Chapter 3* we interpreted and applied theory—presenting the SEWIs in their best possible light—but also offered a reasonable critique. The investigation revolved around scrutinising hypothesis two, H2, *that the ISEW has strong theoretical foundations*. Such an inquest is significant since we are the first in the literature to pool together the fragmented and missing elements of the theoretical puzzle. Contrary to the interpretations of some critics such as Eric Neumayer (1999, 2004, 2007), we found that there are convincing theoretical and experiential reasons for undertaking such studies. It is argued that there are *three* underlying and qualitatively different theories of SEWIs.

The first theory is Daly and Cobb's (1989) conceptual "*economics for community*" oikonomia model for ISEW, which considers the costs and benefits to the whole community, not merely individual agents involved in a transaction. The second theory links Fisher's concept of income to entropy: *entropic net psychic income*. This theory, which is largely supported (and specially commissioned) by Philip Lawn (2003, 2008d), specifies that it is a cost to replacing worn out producer goods such as plant, machinery, and equipment. Based mainly on the readings of Matthew Clarke, the third theory suggests that ISEW (or GPI) is conceptually based on a *social welfare function* (e.g. Clarke and Islam 2004, Clarke and Shaw 2008). Utilising some principles of welfare economics, the ISEW integrates cost-benefit analysis with social choice theory, which incorporates various social concerns about welfare that are not adequately captured by individuals within the market place. The establishment of these three theories is an important result because it charts a clear elucidation of the strengths and weaknesses of the conceptual foundations of ISEW and related indicators in the literature (H2).

On the other hand, there are major limitations in the approach to sustainable development as construed by the advocates of ISEW (and its related variants). Market capitalism has an inner general contradiction associated with periodic major instability, conflict and irregularity—known as the *systemic contradiction of the disembedded economy* (Polanyi 1944). It is argued that the conceptual foundations of the oikonomia model, entropic net psychic income, and the social welfare function are problematic, because there is no underlying linked systems view of creative-destructive processes of capitalism. *They have a tendency to view 'society', 'capital' and 'service' as largely autonomous of any specific socioeconomic system*. That is, the three theories include some major aspects, but have partial, underdeveloped explanations of the benefits/costs generated in the socioeconomic system. Because they failed to incorporate an understanding of the historical socioeconomic

system of capitalism, as the fundamental background condition, the theoretical robustness of ISEW *et al.* is significantly reduced—H2 is questionable. It emerged that the SEWI project is seemingly on the wrong path.

Yet to be fair, these measures are worthy of a more detailed review because it is generally accepted that the net income indices are necessary, workable and adequate measures of sustainable socioeconomic welfare. Chapters four and five critically evaluated the underlying assumptions behind the empirics and techniques of the net income studies. For a realistic appraisal, the literature survey had to be split into two chapters, where the objective was to show how the good points and core problems of SEWI manifest in the critical empirical and technical investigations. This ensured an adequate reflection and appreciation of the complexity, diversity and technical scope of the net income studies. A critical review of the literature was necessary and is significant, as to our knowledge no such document exists.

Chapter 4 provided a comprehensive survey of the net income indices from the perspective of political economy. In this, the first literature survey, we examined the subtext of hypothesis three, H3, which is stated as follows: *net income indices are good measures of environmental and social welfare*. Each study was chronologically assessed, where we examined the degree to which the advocates showed expertise and originality—viz.: 1) the conceptual groundwork; and 2) socio-historical institutional analysis. We scrutinised whether the authors followed or developed Daly and Cobb's oikonomia model, integrated a version of entropic net psychic income, or applied social choice theory. Additionally, we dissected the authors' trends concerning the indicators (where possible), focusing on the calibre of their historical specificity vis-à-vis business cycles and institutional dynamics. After an exhaustive investigation, this study found that in relation to hypothesis three (H3) the conceptual-empirical applications of net income indices by SEWI advocates have been unsuccessful, as discussed below:

In all of the ISEW studies we evaluated, there was *no* conceptual support given to the empirical and historical applications of Daly and Cobb's (1989) persons-in-community theory. Only a few studies (e.g. the SNBI and YF, both devised by Lawn) have contributed to the SEWI's theoretical foundations, namely an ecologised version of Fisher's net psychic income. But the majority of empirical studies have not theoretically advanced their ISEW since *For The Common Good* (1989). Moreover, we found that the main 'theory' of the national GPI is based on a bookkeeping procedure of *commonsensical accountancy*. The theoretics behind the subnational GPIs are also based on the same mechanical operations, which are derived from a simple plus-minus technique. Consequently, there are zero theoretical advances in almost

all cases of the GPIs. The authors' accountancy scheme must rely upon *ad-hoc* changes because there is no strong theoretical *socio*-historical institutional framework to act as guidance. The problem is when ad-hoc techniques override the building of a solid theoretical foundation.

GDP is the very measure advocates of SEWIs wish to minimise from the policy spotlight. Yet, the growth rate of GDP in a historical context is relatively good at both depicting the stage of the business cycle and any effective demand problems emanating (endogenously) from the system. *The majority of the authors' empirical applications have delinked an analysis of GDP growth from the capitalist system*. A lack of historical specificity vis-à-vis the cyclical situation leaves the reader uninformed about how degradation or enhancement of social and environmental development is panning out during these times. A rash application of the real socioeconomic processes of capitalism is the outcome when there is too much focus on 'the gap' between GDP and the SEWI. We showed that without an institutional explanation *and* decomposition, the results of SEWIs could practically suggest anything. The net income indices are *not* very good measures of social (predominantly) and environmental welfare. H3 is thus opposed.

Anchored in good critical thinking, we graded the overall contribution of SEWIs on the Degree of Literary Contribution Scale (DLCS). DLCS gives a mark between 0 and 10 (inclusive). Taken as a whole, the thirty-seven SEWI studies assessed scored 2.9 out of 10 for the conceptual framework building and 5.2 out of 10 for the socio-historical institutional analysis. Sure, there were several good studies with above average marks, such as the Austrian ISEW by Stockhammer *et al.* (1997) and the Australian GPI by Lawn and Clarke (2006b). Yet a high calibre of research was an uncommon characteristic, i.e. no study achieved a score of 9 and above in either category (e.g. a *strong* socio-historical institutional account was not presented). Besides, most authors had a far superior disaggregated account of real socioeconomic institutions to their aggregated inquiry. Disaggregating the SEWI components and utilising socio-historical evidence yield more interesting results when observing social groups than adhering strictly to the indicator as a whole. However, the same thorough treatment for the disaggregated account did not transfer to their aggregated level of investigation of sustainable well-being.

It is better to have more specificity than the SEWI analyses, by examining world and regional changes in real GDP per capita over historical time. Rather than downplaying GDP or strongly modifying it, there is a strong argument that we *could* continue using it (even if GDP is a single monetary indicator). This is because an understanding of the system dynamics of capitalism necessitates a detailed scrutiny of the way GDP ebbs and flows through real historical time. However, the *most*

fundamental thing is not about the indicator itself but having a strong socio-institutional analysis—an indicator (this includes GDP) is completely futile without a detailed explanation substantiating the results—*institutional theory must guide the statistical work*. The historical-institutional material is very important, which was missing from the vast majority of the aggregate indices of ISEW and GPI. There is a tendency in the SEWI literature to engage in quantification for the sake of quantification, but this will not aid our understanding of sustainable socioeconomic welfare. H3 is looking shakier.

A deeper scrutiny of the technical foundations of the net income indices was carried out in *Chapter 5*. This, the second literature survey, was now guided by hypothesis four (H4), viz. *net income indices are innovative measures of welfare and capable of improvement.* We provided a detailed historical-evolutionary account of the *a priori* inclusion and exclusion of variables in the SEWIs. This meant *working out the level of innovatory contributions* undertaken for thirty-three SEWI studies published in the period from 1989 to April 2009. The scale and scope of innovation (an invention *and* implementation of a *new* way or idea of doing something) is a key sub-genre that no author has critically examined. The revised version of the US ISEW by Cobb and Cobb (1994) and the US GPI by Cobb *et al.* (1995) were central to our inquiry. Since these are the two foundational studies in the SEWI literature, they were classified in this study as the 'basic templates'. We developed a simple dual-score ('minor' or 'major') rating system to measure the technical advances of other studies *in relation to* these basic templates *and to* the prevailing empirical material. This rating system is founded on a thorough investigation of the technical literature on SEWIs. The relative degree of contribution is thus determined by the extent to which new extensions of variables and/or considerable changes in technical methods are devised.

There are some very good contributions to the literature. Some of the studies are quite innovatory because of their new extensions of variables and considerable changes in valuational methods, e.g. the original GPI is an important attempt to 'socialise' the ISEW, where the costs of family breakdown, crime, underemployment, lost leisure time, and the benefits of volunteer labour are incorporated. However, relatively speaking, the majority of other studies have not excelled in this area. Many studies slavishly followed the basic templates of Cobb and Cobb (1994) and Cobb *et al.* (1995). We found that a large number of these studies essentially replicated the basic accounting template developed 20 years ago by Daly and Cobb (1989). They merely *imitated their predecessors* by substituting most of the variables of the US ISEW or the US GPI for their region/area of interest. In most cases, they copied the popular commonsensical accounting template without adequate critical analysis

of, or improving upon earlier works.

A final score (100 percent or less) in relation to the Effective Rate of Replication (EROR) was imputed for each study. The EROR pertains to the degree of replication relative to the basic template and to the former studies, based on our dual-score rating system. Interestingly, the overall result for the ISEWs, GPIs, SNBI, and YF *as a collective body* is an EROR of about 87%. This implies that there is a low degree of innovatory practice, and this high replication rate may indicate that there are inherent limits to radically (re)developing the ISEW/GPI, symptomatic of weak measures of handling environmental and social welfare problems (challenging H4). It is argued that there are major limits to which ISEW *et al.* can be transformed within the context of a political economy critique, because SEWI advocates appear to be *stuck with a restricted set of variables* to conduct their analyses of changes in net welfare. H4 is rejected outright as these blemishes are virtually permanent. In short, a tendency for the literature to abstract from real trends in the economy is apparent because of the weak apparatus, mechanical applications, and empirical inconsistencies.

Chapter 6 put forward the fundamental critique of the SEWI approaches, and this is the first study to do so utilising the principles of political economy. Critically absent from *every* SEWI analysis is a *systematic understanding of the political economy and system dynamics of capitalism*. This led to hypothesis five, H5, which states: *understanding the political economy of capitalism will provide vital insights into Net Welfare Indices*. As Polanyi (1944) showed in *The Great Transformation*, reciprocal and redistributive transactions are a significant element of the social economy; they are different from market exchanges. A thorough analysis of economic processes therefore must acknowledge the services (and disservices) generated within non-exchange relationships. The nature of real services engendered within them is critical. However, advocates of SEWIs try to monetarise everything and in the process ineffectually measure certain 'services' transmitted from the multiple forms of capital. This was especially true for the entropic net psychic income version, the dominant theory in the literature.

A major conceptual and empirical shortcoming is that SEWIs do not account for the length of life or quality of the population's health as well as their knowledge, other than the contributions to human welfare from non-defensive expenditures. A well-known limitation of SEWI is that it does not factor-in measures of investment and depreciation of 'human-health capital'—yet this is a critical aspect of sustainable well-being. It is argued that under Fisher's *psychic* income framework, the bedrock of the indicator is a theory that specifies accounting for some sort of change in the human psyche, i.e. the stock of 'human-health capital'. However, with the conjecture of holding the stock of human-health capital constant, by

definition, advocates of SEWIs cannot adequately account for the degree of human health or knowledge, because *this is not their reference point* ('personal consumption expenditures' is their reference point). But, by *not* accounting for these changes in the net stock of human capital, advocates must rely on far-fetched assumptions that the individual must possess perfect knowledge, perfect foresight, access to perfect information, and a stable constitution over time. It was shown that these abstract assumptions are problematic to understanding the political economy of capitalism (H5). For a realistic study the critical factors at work need to be endogenised.

Human needs and preferences are not fixed, but culturally and individually changing over time and space. Conversely, SEWI advocates have started with ceteris paribus assumptions where medium and long-term processes are not affecting the socioeconomic system (H5). We found that they do not account for conspicuous consumption, psychic obsolescence (linked to fashion), and the psychic outgoes (dissatisfactions) endured from an abundance of choice of consumer goods. Such forms of consumption support net social and community welfare loss. Yet, by *not* accounting for these negative forms of consumption in their analyses, the link between real welfare in the disembedded economy and the 'net psychic income' in SEWIs is distorted and hence questioned.

In addition, advocates of SEWIs seem to have mastered 'current and future welfare reductions' relating to ecological dimensions, but they have insufficiently detailed how financial, individual, social, family, and community dimensions relate to a disembedded economy (H5). Because ad-hoc commonsensical accountancy prevails, the authors are inadequately accounting for the *present* well-being effects on the social structure, and do not consistently, as done for ecological capital depreciation, value the *future generational costs (lost services) of an (un)sustainable social capital and human-health capital base*. SEWI restricts the analysis to a few monetary variables and thereby it is too inflexible and not very helpful. Yet, such social services and disservices are elementary for critically evaluating the multiple contradictions of capitalism in a disembedded economy.

An additional sub-hypothesis, H5.1, was therefore raised: *multiple contradictions assess the complexity of the disembedded economy better than single contradictions*. SEWI advocates focus mainly on the contradiction between the natural environment and consumption goods, and their inquiry is, at the most, limited to the national level. It is argued that they are in a *one-and-a-half contradiction world*; they see primarily *one* contradiction and a *partial* social reality from a very nationalistic perspective. In the global disembedded economy, *all* areas of life are both relatively autonomous yet interconnected. There are multiple

contradictions of capitalism to be explored, but it is hard to link all of them in one index. The SEWIs effectively held all other contradictions constant: the inextricable linkages were invisible to advocates. Displacing the contradictions of the disembedded economy in the analysis is *theoretically incongruous with the reality of social life in a market-dominated economy* (H5.1). It is necessary to transcend the one-and-a-half contradiction world and have a broad view of wealth.

It is difficult to determine the true nature of the "service" and its distribution to persons-in-community in an exclusive aggregated net income index. The sub-hypothesis, H5.2, was also raised: *composite net income indicators inadequately measure distribution*. Merely summating the psychic income of individuals in an index trivialises important distributional problems in the market economy. It is argued that we need to scrutinise the moral and social implications of the generation of services/disservices. This is because welfare may be unevenly distributed amongst people of a particular class, ethnicity and/or gender. SEWIs are restricted to an *impartial* measure of these problems. It would be more meaningful and useful if there were a more detailed component analysis of the various dimensions of societal welfare because of the inherent limitations of the single-money composite index (H5.2). *Without* fundamentally understanding the heterogeneous power relations that define the system's reproduction, applications of Net Welfare Indices are ineffective.

In summary, various over-simplified assumptions are employed, particularly regarding the metamorphosis of human and social capitals vis-à-vis psychic income; the connotative acceptance of monetary evaluation as a solitary good measure of 'optimal net welfare'; the ignorance of heterogeneous agents; and the implicit acceptance of personal consumption as the reference point of well-being. It is argued that the aggregated national (or subnational) indicators do not get to the heart of solving real issues, because there is an inadequate understanding of the political economy system. H5, H5.1, and H5.2 are highly relevant. The emerging debate in the literature on indicators of sustainable economic welfare is still saturated in so-called methodological (i.e. measurement or 'construction') limitations, *not* the theoretical underpinning. In essence, this study argued that advocates did not adequately undertake a self-critical analysis of their SEWIs.

GDP and similar variables ignore certain things, as the ISEW and GPI rightly point out. While these measures (ISEW, GPI etc.) try to aggregate the impact of some of the other factors into the overall statistic, this is problematic since there are *qualitative differences* between GDP and related 'economic' variables, and between health–knowledge, individual–social, industrial–financial, and environmental–business capital factors. Nevertheless, GDP accounting has a certain "objectivity" because it

reflects the value accountancy of capital itself, however irrational from a wider sustainable outlook. It is this close relationship of GDP to capitalism, which is the background to the ISEW and other indicators. Yet, SEWI advocates do not recognise the extent to which GDP accounting is an inherent reflection of the system of economic power or how difficult it would be to change things. They essentially start with GDP and try to modify it, letting standard accounting under the prevailing system set the agenda. There may not be any practical alternative to this. Still, a political economy approach would be a *solid critique of GDP*, not an attempt to add to or reform it, recognising that the real issue is the system of which it is merely an index.

The question then naturally becomes, in the context of the political economy critique offered by this study: How might one reconstruct and extend these models, explicitly taking into account the dominant socioeconomic relations? The best theoretical model of ISEW seems to be 'persons-in-community'. This approach acknowledges the importance of community *and* the diversity of the individual. The person-in-community notion is significant because each human being is constituted by relationships to others, and this pattern of relationships is at least as important as the possession of commodities. "The goal of an economics for community is as much to provide meaningful and personally satisfying work as to provide *adequate* goods and services" (Daly and Cobb 1989:165, emphasis added). However, the theory is largely undeveloped and the groundwork of "person-in-community" is effectually isolated from the authors' analysis of ISEW trends. My study is in agreement with Ziegler (2007): that the ISEW is not systematically built from the theory developed by the Daly and Cobb (1989).

Therefore, one *possibility* would be to try to build more consistently than Cobb and Daly themselves do on the persons-in-community analysis, in order to inform the ISEW. Firstly, this involves working out the most important philosophical and ethical questions that relate to the meaning of life itself. For Cobb and Daly, meaningfulness is *not* found when more accumulation of private wealth occurs at the expense of good relationships, community and personhood. Instead of being driven by our consumer culture, meaningful lifestyles—particularly for the relatively well-off in our present day affluent societies—are about keeping possessions within limits. This provides us with more free time to enjoy our social relations and to share our non-commodified commons, conserving ecology, and reducing the stress, confusion and difficulties associated with having too many goods. *This is genuine achievement towards sustainable socioeconomic welfare*.

Secondly, when revamping the persons-in-community model, the critical thing is to *scrutinise the processes in the system that we currently have*. Commerce (à la chrematistics) is the main way in which modern

human societies order their economic process. For instance, in a technological age when the accomplishment of tasks in a quick and efficient manner is considered the greatest good, it is easy to see why so many of us are busy yet terribly lonely. If companionship is a true good, then labour that alienates oneself can only impoverish no matter what the material gain may be. So much of what is accomplished is motivated by rivalry or envy, and yet this hard-charging atmosphere caused by driven, ambitious people leaves little time for meaningful relationships. This is the antithesis of true companionship, and this problem relates to the 'time contradictions of capitalism' (see Stahel 1999).

Thus, developing a more realistic persons-in-community framework entails a comparative empirico-theoretical analysis of the positives of non-market relations and the negatives of life marketization. The inquiry centres on two fundamental questions, which are in tension with each other: *what is genuinely being achieved to have meaningful lives* vs. *how society is working towards commodified goods and labour*? This is akin to the notion of examining the differentials between GDP growth and ISEW. But this approach in the literature is too homogenous as it subjects the whole account to prices, thereby marketising the sustainable well-being variables. To deal with the problem of homogeneity, the alternative must embrace heterogeneity, which will offer a much broader and richer interpretation of the welfare-relevant aspects of the person-in-the-community.

Alternatively, my own approach to provide a more practical alternative to ISEW/GPI would be to utilise the sound and more developed theoretical analysis put forward in this thesis. Accepting the principle of heterogeneity, this study points to important areas that are neglected in the indicators development of the past two decades, including persons-in-community, political, social, historical, institutional dimensions and so on. In light of this study, the best line of attack is to follow in the footsteps of Karl Polanyi and have a lucid inquiry into the disembedded system. In his classical analysis, Polanyi (1944) stressed that markets have always been secondary to the wider social and cultural logic. However, with the rise of the modern market economy, the idea of ordering the social and economic life on purely exchange-value logic has been established. Society as a whole is restructured into a 'market society' in order to allow for the supposedly smooth functioning of the market competition–based economic process. Faced with the contradictions brought forth by its own dynamics, the system exhibits an enormous flexibility and ability to try to neutralise these contradictions by way of converting them into its own chrematistic terms (Stahel 2006:378). This is the 'disembedded economy', and in such a socioeconomic system, *there is inevitably a contradiction between economy and society*.

To support the argument that political economy of the disembedded system is the superior and more viable alternative to ISEW/GPI, I will provide a few concrete examples, followed by a critique of the existing models. Developing a holistic view of the positive and negative elements of the system entails *a historical-institutional analysis of the contradictions of capitalism*. Contradictions are the principle causes of the dynamics and motion of capitalism, which has a positive and a negative side. In order to know an object we must study, embrace and understand the characteristics of *both* aspects of a contradiction. This means that the key elements of the contradiction are regarded and identified together *but cannot be aggregated into the one unit*. Contradictions are intended to handle specially the sensory and active workings of the institutions, groups and processes participating in the system. By analysing and explaining empirically the contemporary dynamics of the system in a historical context, *we can measure to some degree of accuracy the net value of each specific contradiction*. Because the contradictions are relatively autonomous yet intimately related to each other, the advantage is that one avoids the problems associated with lumping together everything in a unitary aggregated index.

At least a couple of good proxy indicators are prerequisites to ascertain both aspects of the contradiction. As an example, consider the individual–family contradiction. On the one hand, the "Economic Freedom of the World index" (EFW) by *The Fraser Institute* is a reasonable (albeit inadequate) proxy for individual freedom. EFW quantifies the multiple rights and liberties associated with various institutions (e.g. business, government, labour) that a country enjoys. EFW is useful because historical data dating from the 1970s are available for many nations. On the other hand, the ratio of divorces to marriages (unweighted average percent) over real historical time could be utilised as a rough proxy for assessing the value of familial capital. Historical data dating from the 1950s are available for a number of nations, from various issues of the Demographic Yearbook by the United Nations (Department of Economic and Social Affairs). Clearly, the divorces/marriages ratio is not a sufficient proxy for the quality of relationships; it should be supplemented with several other measures such as social trust. Notwithstanding, the key message is that in order to serve as a viable alternative to the ISEW/GPI framework, the time-series data on such *non-aggregative variables* need to be organised in a sophisticated and meaningful way.

This is where the Brennan Illustrative Figure (BIF) can help (which was introduced in *Chapter 4*, Section 4.10). Recall that the BIF is a dual-window figure that combines a table and a graph in one diagram, and shows a specific critical value (or values) of importance. The BIF can be utilised to show the progression or regression in each dimension and the

associated trend averages, expressed in terms of percent change. This method posits that the scholar must critically evaluate the destruction and creation of the various forms of capitals, identifying a specific value (or range of values) of fundamental importance as historically determined. The scholar then undertakes an extensive comparative analysis between regions and nations, measuring in absolute and relative terms, flows and stocks, long- and short-run movements. In the case above, for instance, we might find that after a certain plateau of individual freedom is reached (as defined by EFW) family commitments disintegrate. Linking to Polanyi's (1944) thesis, an increasing degree of disembeddedness is apparent: pursuits of the individual are in tension with family stability. In other words, depending on the actual weight of evidence the contradiction may not be in balance.

The political economy approach overcomes one of the major problems of the net income indicators, which erroneously treat capitals as statistically aggregative. For example, advocates of the GPI calculated only pecuniary costs of family breakdown. However, *once* the aggregated indicator has been computed, assessing the societal damage of divorce is in effect very difficult to determine, as it accounts for a relatively small value compared to other cost items such as 'long-term environmental damage'. It is more effective to separate such complex social phenomena and scrutinise the pertinent 'trade-offs' i.e. the contradictions independently. Moreover, advocates of SEWIs ignored a measure of the consumption (destruction) of social capital. It is difficult to tell how well society is going in a SEWI. 'Society' is lost in translation because SEWI advocates are obsessed with the ecological sphere. A similar problem arises if all our vigour is devoted simply to social or family capitals. Whatever the spheres of interest, *the key is to have a strong socio-historical institutional analysis of the multiple contradictions of capitalism*.

What is the 'minimum standard' that would be needed to be a part of these non-monetary, multi-indicators? In relation to this study, there needs to be *a specific focus on systemic unevenness*. The fulcrum of unevenness is the differential return on investment that creation and/or destruction of social-environmental structures offer to different kinds of investors with different time horizons. Countries with poorer initial conditions can face greater difficulties to benefit from world growth and development than countries with richer endowments. For example, the politics of neoliberal capital in Africa is about dispossession. State power is needed for establishing a solid legislative framework, *and* to eliminate people from land, to crush informal and artisanal modes of mining, to ensure the removal of resources from land, and to smother rebellions and resistance (Bush 2008:361). In relation to Polanyi's (1944) thesis, the redistribution of land and raw materials to capital and the dislocation of

people and their existing livelihoods point to 'disembeddedness' in their economies.

Hence, examining the *distributional aspects of core–periphery (and semi-periphery) relations* is significant when we are interested in undertaking a local, regional and global analysis of capitalism. Indeed, some interesting works are emerging in the political economy literature, which will provide impetus for further research. For instance, O'Hara (2010) wants to a gain a broader understanding of the dynamic motion of uneven development in the real world, by linking economic with social and environmental factors in a holistic way. The author realises the need for qualitative inquiry where relevant and taking into account deficiencies of statistics. Accepting the teaching of heterogeneity, he then examines the quantitative changes in the multiple forms of capital that represent "institutional investment" (increases in capital) or "institutional consumption" (decline in capital). His analysis reveals that we need to have a global approach to continental, national and even sub-national political economy issues, since there is a tendency for uneven development in capitalism (and also for many of the other processes). A comparative approach is thus required for exploring the current and future course of global capitalism in a historical and institutional context, paying particular attention to measurement as much as possible. In summary, by utilising the political economy approach and a BIF (or some equivalent) the degree of disembeddedness between core–periphery can be ascertained.

This accounts for critically important social and environmental dimensions, while leaving enough flexibility regarding the specifics so that context specific relevance could be taken into account. A major argument of this thesis is that there is a need to transcend the purely national; since the nation is relatively autonomous yet interlinked with global, regional and local systems. This is so critical for distributional matters and public policy. Environmental integrity and social justice are difficult to achieve, when we are up against a seemingly immutable capitalist system that is globally driven by the contradictory dynamics of uneven development. We need to go beyond a mechanical operational procedure employed by the vast majority of SEWI studies *because many of the more critical aspects are non-aggregative and heterogeneous*. SEWIs will likely not help very much, but political economy will enlighten us on how to deal with such critical real world problems.

References

Aboderin, Isabella (2004) "Intergenerational Family Support and Older Age Economic Security in Ghana", in Peter Lloyd-Sherlock (Ed.), *Living Longer: Ageing, Development and Social Protection*, London: United Nations Research Institute for Social Development and Zed Books, part III, ch.10.

Amato, Paul R. and Bryndl Hohmann-Marriott (2007) "A Comparison of High- and Low-Distress Marriages That End in Divorce", *Journal of Marriage and Family*, vol. 69 (3), pp. 621-638.

Amin, Samir (2008) "'Market Economy' or Oligopoly-Finance Capitalism", *Monthly Review*, vol. 59 (11), pp. 51-61.

Anielski, Mark (2001) The Alberta GPI Blueprint. The Genuine Progress Indicator (GPI) Sustainable Well-Being Accounting System, Pembina Institute. Retrieved: 06 August, 2003, from http://www.bgiedu.org/BGI-PDFs/Alberta%20GPI%20Blueprint.pdf%201.pdf.

Anielski, Mark and Jonathan Rowe (1999) "The Genuine Progress Indicator – 1998 Update", *Redefining Progress* (March).

Argitis, George and Christos Pitelis (2006) "Global Finance, Income Distribution and Capital Accumulation", *Contributions to Political Economy*, vol. 25, pp. 63-81.

Arias, Omar S. (2006) "Breaking the Cycle of Underinvestment in Human Capital in Latin America", in Guillermo Perry, Omar S. Arias, J. Humberto López, William F. Maloney and Luis Servén (Eds.), *Poverty Reduction and Growth: Virtuous and Vicious Circles*, Washington, D.C.: The International Bank for Reconstruction and Development / World Bank.

Arrow, Kenneth J. (1951) *Social Choice and Individual Value*, New York: John Wiley and Sons.

Atkinson, Anthony B. (1970) "On the Measurement of Inequality", *Journal of Economic Theory*, vol. 2, pp. 244-263.

Atkinson, Giles (1995) "Measuring Sustainable Economic Welfare: A Critique of the UK ISEW", *CSERGE Working Paper*, vol. 95-08.

Atkinson, Giles, K. Hamilton, Mohan Munasinghe, D. Pearce and C. Young (1997) *Measuring Sustainable Development*, London: Elgar.

Atkinson, Glen (2008) "Purpose and Measurement of National Income and Product", *Journal of Economic Issues*, vol. 62 (2), pp. 303-316.

Australian Bureau of Statistics (ABS) (2000) Australian National Accounts: Concepts, Sources and Methods. Chapter 7: Flows, Stocks and Accounting Rules. Retrieved: 14 June, 2005, from http://www.abs.gov.au/Ausstats.

Australian Bureau of Statistics (ABS) (2005a) Measuring Australia's Economy. Section 2. Summary Measures of Economic Activity (National Accounts), Australian Bureau of Statistics, Cat. 1360.0. from http://www.abs.gov.au/Ausstats.

Australian Bureau of Statistics (ABS) (2005b) Year Book Australia. National Accounts – Defining and Measuring GDP, Australian Bureau of Statistics, Cat. 1301.0. Retrieved: 14 June, 2005, from http://www.abs.gov.au/Ausstats.

Bagstad, Kenneth J. and Marta Ceroni (2007) "Opportunities and Challenges in Applying the Genuine Progress Indicator/Index of Sustainable Economic Welfare at Local Scales", *International Journal of Environment, Workplace and Employment*, vol. 3 (2), pp. 132-153.

Bales, Kevin (2004) *Disposable People. New Slavery in the Global Economy*, Berkeley and Los Angeles: University of California Press.

Bangs, Robert B. (1940) "The Definition and Measurement of Income", *The Accounting Review*, vol. 15 (3), pp. 353-371.

Bankston III, Carl. L. and Min Zhou (2002) "Social Capital as Process: The Meanings and Problems of a Theoretical Metaphor", *Sociological Inquiry*, vol. 72 (2), pp. 285-317.

Banzhaf, H. Spencer (2001) "Quantifying the Qualitative: Quality-Adjusted Price Indexes in the United States, 1915–61", *History of Political Economy*, vol. 33 (Suppl 1), pp. 345-370.

Banzhaf, H. Spencer (2004) "The Form and Function of Price Indexes - A Historical Accounting", *History of Political Economy*, vol. 36, pp. 589-616.

Baran, Paul A. (1957) *The Political Economy of Growth*, New York: Monthly Review Press.

Baran, Paul A. and Paul M. Sweezy (1966) *Monopoly Capital: An Essay on the American Economic and Social Order*, New York: Monthly Review Press.

Baran, Paul A. and Paul M. Sweezy (1968) "Economics of Two Worlds", in David Horowitz (Ed.), *Marx and Modern Economics*, New York: Modern Reader Paperbacks, pp. 291-311.

Barber, William J. (1997) *The Works of Irving Fisher*, London: Pickering and Chatto.

Barkley, Paul W. and David W. Seckler (1972) *Economic Growth and Environmental Decay. The Solution Becomes the Problem*, New York: Harcourt Brace Jovanovich, Inc.
Bartelmus, Peter (2007) "SEEA-2003: Accounting for Sustainable Development?", *Ecological Economics*, vol. 61, pp. 613-616.
Bergson, Abram (1938) "A Reformulation of Certain Aspects of Welfare Economics", *Quarterly Journal of Economics*, vol. 52, pp. 310-334.
Bezlova, Antoaneta (2002) China: Santa's Sweatshops, December 24. Retrieved: March 19, 2004, from http://www.atimes.com/atimes/China/DL24Ado1.html.
Binswanger, Mathias (2004) "Stock Returns and Real Activity in the G-7 Countries – Did the Relationship Change During the 1980s", *The Quarterly Review of Economics and Finance*, vol. 44 (2), pp. 237-252.
Bitzer, Jürgen (2005) "Measuring Knowledge Stocks: A Process of Creative Destruction", *Kyklos*, vol. 58 (3), pp. 379-393.
Blaug, Mark (2007) "The Fundamental Theorems of Modern Welfare Economics, Historically Contemplated", *History of Political Economy*, vol. 39 (2), pp. 185-207.
Bleys, Brent (2006a) *The Index of Sustainable Economic Welfare Case Study for Belgium: First Attempt and Preliminary Results*, Brussels, Belgium: Vrije Universiteit Brussel.
Bleys, Brent (2006b) *The Index of Sustainable Economic Welfare for Belgium. Data, Methodology and Preliminary Results*, Brussels, Belgium: Department MOSI – Vrije Universiteit Brussel, Report MOSI/27.
Bleys, Brent (2007a) *A Simplified Index of Sustainable Economic Welfare for the Netherlands, 1971–2004*, Brussels, Belgium: Vrije Universiteit Brussel.
Bleys, Brent (2007b) "Simplifying the Index of Sustainable Economic Welfare: Methodology, Data Sources and A Case Study for The Netherlands", *International Journal of Environment, Workplace and Employment*, vol. 3 (2), pp. 103-118.
Bleys, Brent (2008) "Proposed Changes to the Index of Sustainable Economic Welfare: An Application to Belgium", *Ecological Economics*, vol. 64, pp. 741-751.
Boadway, R. and N. Bruce (1984) *Welfare Economics*, Oxford: Basil Blackwell.
Böhringer, Christoph and Patrick E. P. Jochem (2007) "Measuring the Immeasurable – A Survey of Sustainability Indices", *Ecological Economics*, vol. 65, pp. 1-8.
Boles, J. M. (1998) "James Rorty's Social Ecology: Technology, Culture, and the Economic Base of an Environmentally Sustainable Society", *Organization & Environment*, vol. 11 (155-179).
Boulding, Kenneth E. (1945) "The Consumption Concept in Economic Theory", *American Economic Review*, vol. May (2).
Boulding, Kenneth E. (1949-50) "Income or Welfare", *The Review of Economic Studies*, vol. 17, pp. 77-86.
Boulding, Kenneth E. (1950) *A Reconstruction of Economics*, New York: John Wiley & Sons, Inc.
Boulding, Kenneth E. (1957) "Segments of the Economy – 1956", in *A Symposium*, Cleveland: Howard Allen, pp. 8-55.
Boulding, Kenneth E. (1961) "What is Economic Progress?", *Cahiers de l' Institue de Science Economique Appliquée*, vol. 110 (Feb. 1961), pp. 147-155.
Boulding, Kenneth E. (1966a) "Economics and Ecology", in F. Fraser Darling and John P. Milton (Eds.), *Future Environments in North America*, New York: Garden City, pp. 225-234.
Boulding, Kenneth E. (1966b) "The Economics of Knowledge and the Knowledge of Economics", *American Economic Review*, vol. 16 (2), pp. 1-13.
Boulding, Kenneth E. (1966c) "The Economics of The Coming Space-Ship Earth", in Henry Jarrett (Ed.), *Environmental Quality in a Growing Economy*, Baltimore, Md.: John Hopkins Press for Resources for the Future, Inc.
Boulding, Kenneth E. (1970) "Fun and Games with the Gross National Product: The Role of Misleading Indicators in Social Policy", in Harold W. Helfrich (Ed.), *The Environmental Crisis*, New Haven: Yale University Press, pp. 157-170.
Boulding, Kenneth E. (1971) "Environment and Economics", in W. W. Murdock (Ed.), *Environment, Resources, Pollution and Society*, Stamford, Conn.: Sinauer Assoc. Inc.
Bourdieu, Pierre (1983) "The Forms of Capital (Ökonomisches Kapital, kulturelles Kapital, soziales Kapital)", in Reinhard Kreckel (Ed.), *Soziale Ungleichheiten (Soziale Welt, Sonderheft 2)*, Goettingen: Otto Schartz & Co, pp. 183-198.
Bourdieu, Pierre (1997) "The Three Forms of Capital", in A. H. Halsey, High Lauder, Phillip Brown and Amy Stuart Wells (Eds.), *Education: Culture, Economy and Society*, Oxford: Oxford University Press, pp. 46-58.

Bourdieu, Pierre and Jean-Claude Passeron (1977) *Reproduction in Education, Society and Culture*, London: Sage.
Bowles, Samuel (1985) "The Production Process", *American Economic Review*, vol. 75, pp. 16-36.
Bowles, Samuel (1998) "Endogenous Preferences – The Cultural Consequences of Markets and Other Economic Institutions", *Journal of Economic Literature*, vol. 36 (March), pp. 75-111.
Bowles, Samuel and Herbert Gintis (1975) "The Problem with Human Capital Theory—A Marxian Critique", *The American Economic Review*, vol. 65 (2), pp. 74-82, Papers and Proceedings of the Eighty-seventh Annual Meeting of the American Economic Association (May, 1975).
Bowles, Samuel, David M. Gordon and Thomas E. Weisskopf (1990) *After the Wasteland: A Democratic Economic for the Year 2000*, New York and London: M.E. Sharpe.
Boyd, James (2007) "Nonmarket Benefits of Nature: What Should be Counted in Green GDP?", *Ecological Economics*, vol. 61, pp. 716-723.
Boyd, James (2008a) *Counting Nonmarket, Ecological Public Goods: The Elements of a Welfare-Significant Ecological Quantity Index*, Washington, DC: Resources for the Future, Discussion Paper 07-42, pp. 1-25.
Boyd, James (2008b) *Don't Measure, Don't Manage: GDP and the Missing Economy of Nature*, Washington, DC: Resources for the Future, Issue Brief 08-01, pp.1-11.
Boyd, James and H. Spencer Banzhaf (2007) "What are Ecosystem Services? The Need for Standardized Environmental Accounting Units", *Ecological Economics*, vol. 63, pp. 616-626.
Brennan, Andrew John (2004) "Global Environmental Problems: Climate Change and Biodiversity Loss", in Phillip Anthony O'Hara (Ed.), *Global Political Economy and the Wealth of Nations: Performance, Institutions, Problems and Policies*, London and New York: Routledge.
Brennan, Andrew John (2008) "Theoretical Foundations of Sustainable Economic Welfare Indicators — ISEW and Political Economy of the Disembedded System", *Ecological Economics*, vol. 67 (1), pp. 1-19.
Brouwer, Roy and Christian Leipert (1999) "The Role of Environmental Protection Expenditure in Integrated Economic-Environmental Accounting: Tuning Theoretical Perspectives and Statistical Realities", *International Journal of Sustainable Development*, vol. 2 (1), pp. 185-200.
Brown, Beth and Doug Brown (2005) "Beyond Boganism", *The Journal of Popular Culture*, vol. 38 (4), pp. 632-649.
Brown, Doug (2002) *Insatiable is Not Sustainable*, Westport, Connecticut: Praeger.
Brown, Doug (2004) "Conspicuous Consumption, Fashion and Style in the Global Marketplace", in Phillip Anthony O'Hara (Ed.), *Global Political Economy and the Wealth of Nations: Performance, Institutions, Problems and Policies*, London and New York: Routledge, pp. 208-221.
Bryson, Christopher (2004) *The Fluoride Deception*, New York and London: Seven Stories Press.
Budnevich, Carlos (2008) *Stabilization Funds to Mitigate Economic Vulnerability*, Background Paper for *World Economic and Social Survey 2008*.
Bureau of Economic Analysis (BEA) (1991) Gross Domestic Product as a Measure of U.S. Production, Bureau of Economic Analysis. Retrieved: 14 June, 2005, from www.bea.gov.
Burkett, Paul (2006) *Marxism and Ecological Economics. Toward a Red and Green Political Economy*, Leiden, the Netherlands: Brill.
Bush, Ray (2008) "Scrambling to the Bottom? Mining, Resources & Underdevelopment", *Review of African Political Economy*, vol. 35 (117), pp. 361-366.
Campbell, John L. and Ove K. Pedersen (2008) "The Varieties of Capitalism and Hybrid Success: Denmark in the Global Economy", *Comparative Political Studies*, vol. 40 (3), pp. 307-332.
Cantwell, John and Grazia D. Santangelo (2000) "Capitalism, Profits and Innovation in the New Techno-Economic Paradigm", *Journal of Evolutionary Economics* (10), pp. 131-157.
Carroll, Michael and James Ronald Stanfield (2003) "Social Capital, Karl Polanyi, and American Social and Institutional Economics", *Journal of Economic Issues*, vol. 37 (2), pp. 397-404.
Castañeda, Beatriz E. (1999) "An Index of Sustainable Economic Welfare (ISEW) for Chile", *Ecological Economics*, vol. 28, pp. 231-244.
Castles, Ian (1998) "Measuring Wealth and Welfare: Why the HDI and the GPI Fail", in *Wealth, Work, Well-Being. Cunningham Lecture and Annual Symposium 1997*, Canberra: Academy of the Social Sciences in Australia (Occasional Paper Series 1/1998), pp. 34-53.
Chakraborty, Achin (2001) *The Concept and Measurement of Group Inequality*, Centre for Development Studies, Trivandrum, Working Paper Series 315, May 2001.
Chakraborty, Achin (2002) "Issues in Social Indicators, Composite Indices and Inequality", *Economic and Political Weekly*, vol. March 30, 2002, pp. 1199-1202.

Champlin, Dell P. and Janet T. Knoedler (2002) "Wages in the Public Interest: Insights from Thorstein Veblen and J. M. Clark", *Journal of Economic Issues*, vol. 48 (4), pp. 877-891.
Champlin, Dell P. and Janet T. Knoedler (2004) "Embedded Economies, Democracy, and the Public Interest", *Journal of Economic Issues*, vol. 38 (4), pp. 893-907.
Chan, Anita and Hong-zen Wang (2004/2005) "The Impact of the State on Workers' Conditions – Comparing Taiwanese Factories in China and Vietnam", *Pacific Affairs*, vol. 77 (4), pp. 629-646.
Chan, Gerald, Pak K. Lee and Lai-Ha Chan (2008) "China's Environmental Governance: The Domestic–International Nexus", *Third World Quarterly*, vol. 29 (2), pp. 291-314.
Chen, Shaohua and Martin Ravallion (2007) *Absolute Poverty Measures for the Developing World, 1981-2004*, Washington, D.C.: World Bank Policy Research Working Paper, No. 4211
Cheng, Jacqui (2007) "Survey: Blackberry Owners Chained to Work ", *Ars Technica*, 15 February 2007 1:30:39 PM, Available Online: http://arstechnica.com/news.ars/post/20070215-8858.html [Retrieved: 24 February, 2007].
Cherlin, Andrew J. (2004) "The Deinstitutionalization of American Marriage", *Journal of Marriage and Family*, vol. 66 (4), pp. 848-861.
CIA World Factbook (2008) "Japan". Retrieved: 31 December, 2008, from https://www.cia.gov/library/publications/the-world-factbook/geos/ja.html.
Clark, Charles M. A. (2006) "Christian Morals and the Competitive System Revisited", *Journal of Economic Issues*, vol. 60 (2), pp. 261-275.
Clark, Colin Grant (1940) *Conditions of Economic Progress*, London: Macmillan.
Clarke, Matthew (2003) *Is Economic Growth Desirable? A Welfare Economic Analysis of the Thai Experience*, PhD thesis, Centre for Strategic Economic Studies, Victoria University, Melbourne.
Clarke, Matthew (2006a) "Measuring Human Well-being in Thailand – A Normative Social Choice Approach", *Journal of the Asia Pacific Economy*, vol. 11 (2), pp. 151-167.
Clarke, Matthew (2006b) "Policy Implications of the Index of Sustainable Economic Welfare: Thailand as a Case Study", in Philip A. Lawn (Ed.), *Sustainable Development Indicators in Ecological Economics*, Cheltenham, UK: Edward Elgar, pp. 166-185.
Clarke, Matthew (2007) "Is the Genuine Progress Indicator Really Genuine? Considering Well-Being Impacts of Exports and Imports", *International Journal of Environment, Workplace and Employment*, vol. 3 (2), pp. 91-102.
Clarke, Matthew and Sardar M. N. Islam (2003) "Measuring Social Welfare: Application of Social Choice Theory", *Journal of Socio-Economics*, vol. 32, pp. 1-15.
Clarke, Matthew and Sardar M. N. Islam (2004) *Economic Growth and Social Welfare: Operationalising Normative Social Choice Theory*, Amsterdam: North Holland Publishing.
Clarke, Matthew and Sardar M. N. Islam (2005a) "Diminishing and Negative Welfare Returns of Economic Growth: An Index of Sustainable Economic Welfare (ISEW) for Thailand", *Ecological Economics*, vol. 54, pp. 81-93.
Clarke, Matthew and Sardar M. N. Islam (2005b) "The Relationship Between National Income and Health: A New Measure Applied to Bangkok", *Progress in Development Studies*, vol. 5 (3), pp. 182-198.
Clarke, Matthew and Sardar M. N. Islam (2006) "National Account Measures and Sustainability Objectives: Present Approaches and Future Prospects", *Sustainable Development*, vol. 14, pp. 219-233.
Clarke, Matthew and Philip A. Lawn (2005) "Measuring Victoria's Genuine Progress – A Genuine Progress Indicator For Victoria", *Economic Papers*, vol. 24 (4), pp. 368-389.
Clarke, Matthew and Philip A. Lawn (2006) "A Response to "Comment on Measuring Victoria's Genuine Progress: A Genuine Progress Indicator (GPI) for Victoria"", *Economic Papers*, vol. 25 (3), pp. 298-300.
Clarke, Matthew and Philip A. Lawn (2007) "Comparing Australia's Genuine Progress to its Economic Growth Performance", *International Journal of Green Economics*, vol. 1 (3/4), pp. 513-531.
Clarke, Matthew and Philip A. Lawn (2008) "Is Measuring Genuine Progress at the Sub-national Level Useful?", *Ecological Indicators*, vol. 8, pp. 573-581.
Clarke, Matthew and Judith Shaw (2008) "Genuine Progress in Thailand: A Systems-Analysis Approach", in Philip A. Lawn and Matthew Clarke (Eds.), *Sustainable Welfare in the Asia-Pacific*, Cheltenham, UK: Edward Elgar, Ch.10, pp. 260-298.
Clayton, Anthony M. H. and Nicholas J. Radcliffe (1996) *Sustainability: A Systems Approach*, London: Earthscan Publications Ltd.

Cobb, Clifford W. (1989) "Appendix: The Index of Sustainable Economic Welfare", in Herman E. Daly and John B. Cobb Jr. (Eds.), *For the Common Good: Redirecting the Economy toward Community, the Environment, and a Sustainable Future*, First edn, Boston, Massachusetts: Beacon Press, pp. 443-507.
Cobb, Clifford W. (1994) "Appendix: The Index of Sustainable Economic Welfare", in Herman E. Daly and John B. Cobb Jr. (Eds.), *For the Common Good: Redirecting the Economy toward Community, the Environment, and a Sustainable Future*, Second edn, Boston, Massachusetts: Beacon Press, pp. 443-507.
Cobb, Clifford W. and John B. Cobb Jr. (1994) *The Green National Product – A Proposed Index of Sustainable Economic Welfare*, Lanham and New York: University of America.
Cobb, Clifford W., Mark Glickman and Craig Cheslog (2001) *The Genuine Progress Indicator 2000 Update* Redefining Progress Issue Brief.
Cobb, Clifford W., Gary Sue Goodman and Joanne C. May Kliejunas (2000) *Blazing Sun Overhead and Clouds on the Horizon. The Genuine Progress Report for 1999*, Oakland, California: Redefining Progress.
Cobb, Clifford W., Gary Sue Goodman and Mathis Wackernagel (1999) "Why Bigger Isn't Better – The GPI 1999 Update", *Redefining Progress* (November).
Cobb, Clifford W., Ted Halstead and Jonathan Rowe (1995) "The Genuine Progress Indicator. Summary of Data and Methodology", *Redefining Progress* (September).
Cochrane, Phoebe (2006) "Exploring Cultural Capital and its Importance in Sustainable Development", *Ecological Economics*, vol. 57, pp. 318-330.
Costanza, Robert (1999) "The Ecological, Economic, and Social Importance of the Oceans", *Ecological Economics*, vol. 31, pp. 199-213.
Costanza, Robert, Jon Ericksona, Karen Fligger, Alan Adams, Christian Adams, Ben Altschuler, Stephanie Balter, Brendan Fisher, Jessica Hike, Joe Kelly, Tyson Kerr, Megan McCauley, Keith Montone, Michael Rauch, Kendra Schmiedeskamp, Dan Saxton, Lauren Sparacino, Walter Tusinski and Laurel Williams (2004) "Estimates of the Genuine Progress Indicator (GPI) for Vermont Chittenden County and Burlington, from 1950 to 2000", *Ecological Economics*, vol. 51, pp. 139-155.
Costanza, Robert, J. Farley and P. Templet (2002) "Quality of Life and the Distribution of Wealth and Resources", in Robert Costanza and S.E. Jørgensen (Eds.), *Understanding and Solving Environmental Problems in the 21st Century*, Elsevier Science.
Crafts, Nicholas (2002) "UK Real National Income, 1950–1998: Some Grounds for Optimism", *National Institute Economic Review*, vol. 81 (1), pp. 87-96.
CSO (Central Statistics Office, Ireland) (2004) Measuring Ireland's Progress, 2004. Retrieved: 15 September, 2005, from http://www.cso.ie/releasespublications/measuringirelandsprogress2004.htm.
Daly, Herman E. (1978) *Steady-State Economics: The Economics of Biophysical Equilibrium and Moral Growth*, New York: W. H. Freeman & Co.
Daly, Herman E. (1979), in Vincent Kerry Smith (Ed.), *Scarcity and Growth Reconsidered*, Baltimore, Maryland: The John Hopkins University Press.
Daly, Herman E. (1991) *Steady-State Economics. Second Edition with New Essays*, Washington, D.C.: Island Press.
Daly, Herman E. (1996) *Beyond Growth*, Boston: Beacon Press.
Daly, Herman E. (1999) *Ecological Economics and the Ecology of Economics*, Cheltenham, UK: Edward Elgar.
Daly, Herman E. and John B. Cobb Jr. (1989) *For the Common Good: Redirecting the Economy Toward Community, the Environment, and a Sustainable Future*, Boston, Massachusetts: Beacon Press.
Daly, Herman E. and John B. Cobb Jr. (1994) *For the Common Good: Redirecting the Economy Toward Community, the Environment, and a Sustainable Future, Second Edition*, Boston, Massachusetts: Beacon Press.
Daly, Herman E. and John B. Cobb Jr. (2007) "ISEW. The 'Debunking' Interpretation and the Person-in-Community Paradox: Comment on Rafael Ziegler", *Environmental Values*, vol. 16 (3), pp. 287-288.
Davis, John B. (2003) *The Theory of the Individual in Economics*, London and New York: Routledge.

Diefenbacher, Hans (1994) "The Index of Sustainable Economic Welfare: A Case Study of The Federal Republic of Germany", in Clifford Cobb and John B. Cobb Jr. (Eds.), *The Green National Product – A Proposed Index of Sustainable Economic Welfare*, Lanham and New York: University of America.
Diesing, Paul (1971) *Patterns of Discovery in the Social Sciences*, Chicago: Aldine-Atherton.
Dietz, Simon and Eric Neumayer (2006a) "A Critical Appraisal of Genuine Savings as an Indicator of Sustainability", in Philip A. Lawn (Ed.), *Sustainable Development Indicators in Ecological Economics*, Cheltenham, UK: Edward Elgar, pp. 117-138.
Dietz, Simon and Eric Neumayer (2006b) "Some Constructive Criticisms of the Index of Sustainable Economic Welfare", in Philip A. Lawn (Ed.), *Sustainable Development Indicators in Ecological Economics*, Cheltenham, UK: Edward Elgar, pp. 186-208.
Dietz, Simon and Eric Neumayer (2007) "Weak and Strong Sustainability in the SEEA: Concepts and Measurement", *Ecological Economics*, vol. 61, pp. 617-626.
Dolfsma, Wilfred (2004) "Paradoxes of Modernist Consumption – Reading Fashions", *Review of Social Economy*, vol. 62 (3), pp. 351-364.
Dolfsma, Wilfred, John Finch and Robert McMaster (2005) "Market and Society – How Do They Relate, and How Do They Contribute to Welfare", *Journal of Economic Issues*, vol. 29 (2), pp. 347-356.
Downward, Paul, John H. Finch and John Ramsay (2002) "Critical Realism, Empirical Methods and Inference: A Critical Discussion", *Cambridge Journal of Economics*, vol. 26 (4), pp. 481-500.
Dowrick, Steve and John Quiggin (1998) "Measures of Economic Activity and Welfare: The Uses and Abuses of GDP", in Richard Eckersley (Ed.), *Measuring Progress*, Collingwood, Victoria: CSIRO Publishing.
Duesenberry, James S. (1949) *Income, Saving and the Theory of Consumer Behavior*, London, Geoffrey Cumberledge: Harvard University Press.
Dugger, William M. (1977) "Social Economics: One Perspective", *Review of Social Economy*, vol. 35 (December), pp. 299-310.
Dugger, William M. (1989) "Emulation: An Institutional Theory of Value Formation", *Review of Social Economy*, vol. 47.
Ebert, Udo and Heinz Welsch (2004) "Meaningful Environmental Indices: A Social Choice Approach", *Journal of Environmental Economics and Management*, vol. 47, pp. 270-283.
ECLAC (2007a) *Social Cohesion: Inclusion and a Sense of Belonging in Latin America and the Caribbean*, Chile: United Nations.
ECLAC (2007b) *Social Panorama of Latin America* United Nations, Social Development Division and the Statistics and Economic Projections Division of ECLAC.
Edwards, Sebastian and Alejandra Cox Edwards (1987) *Monetarism and Liberalization. The Chilean Experiment*, Cambridge, Massachusetts: Ballinger.
Eisner, Robert (1988) "Extended Accounts for National Income and Product", *Journal of Economic Literature*, vol. 26, pp. 1611-1684.
Eisner, Robert (1994) "The Index of Sustainable Welfare: Comment", in Clifford Cobb and John B. Cobb Jr. (Eds.), *The Green National Product. A Proposed Index of Sustainable Economic Welfare*, Boston: University Press of America.
Elliot, John E. (1978-79) "Marx's *Grundrisse*: Vision of Capitalism's Creative Destruction", *Journal of Post Keynesian Economics*, vol. 1 (2), pp. 148-169.
Elliot, John E. (1980) "Marx and Schumpeter on Capitalism's Creative Destruction: A Comparative Restatement", *The Quarterly Journal of Economics*, vol. 95 (1), pp. 45-68.
England, Richard W. (1998) "Measurement of Social Well-being: Alternatives to GDP", *Ecological Economics*, vol. 25, pp. 89-103.
England, Richard W. (2001) "Alternatives to Gross Domestic Product: A Critical Survey", in Robert Costanza, Cutler J. Cleveland and David I. Stern (Eds.), *The Economics of Nature and the Nature of Economics*, Cheltenham, UK: Edward Elgar, pp. 218-237.
England, Richard W. (2006) "Measurement of the Natural Capital Stock: Conceptual Foundations and Preliminary Empirics", in Philip A. Lawn (Ed.), *Sustainable Development Indicators in Ecological Economics*, Cheltenham, UK: Edward Elgar, pp. 209-220.
Erikson, Susan L. (2007) "Diagnoses and Prescriptions", *Foreign Affairs*, vol. 86 (3), pp. 168-169.
Erikson, Susan L. (2008) "Getting Political: Fighting for Global Health", *Lancet*, vol. 371 (April 12), pp. 1229-1230.
Evans, Gary W and Elyse Kantrowitz (2002) "Socioeconomic Status and Health: The Potential Role of Environmental Risk Exposure", *Annual Review of Public Health*, vol. 23, pp. 303-331.

Eyles, John and Nicole Consitt (2004) "What's at risk? Environmental Influences on Human Health", *Environment*, vol. 46 (8), pp. 24-40.
Fincher, Jonalyn Grace (2007) *Ruby Slippers. How the Soul of a Woman Brings Her Home*, Michigan: Zondervan.
Fisher, Irving (1906) *The Nature of Capital and Income*, New York: A.M. Kelly.
Fisher, Irving (1937) "Income in Theory and Income Taxation in Practice", *Econometrica*, vol. 5 (1), pp. 1-55.
Fisher, Irving (1939) "The Concept of Income: A Rebuttal", *Econometrica*, vol. 7 (4), pp. 357-361.
Fisher, Irving (1976) *National Vitality, It's Wastes and Conservation*, New York: Arno Press.
Fishman, Ted C. (2005) *China, Inc. How the Rise of the Next Superpower Challenges America*, New York: Scribner.
Flannery, Tim (1994) *The Future Eaters*, Sydney: Reed New Holland.
Forgie, Vicky (2007) "The Need for 'Convention' in Environmental Valuation", *International Journal of Environment, Workplace and Employment*, vol. 3 (2), pp. 72-90.
Forgie, Vicky, Garry McDonald, Yanjiao Zhang, Murray Patterson and Derrylea Hardy (2008) "Calculating the New Zealand Genuine Progress Indicator", in Philip A. Lawn and Matthew Clarke (Eds.), *Sustainable Welfare in the Asia-Pacific*, Cheltenham, UK: Edward Elgar, Ch.6, pp. 126-152.
Foster, John Bellamy (1999) "Contradictions in the Universalization of Capitalism", *Monthly Review*, vol. 50 (11), pp. 29-39.
Foster, John Bellamy (2002) "Capitalism and Ecology: The Nature of the Contradiction", *Monthly Review*, vol. 54 (4), pp. 6-16.
Foster, John Bellamy (2004) "Ecology, Capitalism, and the Socialization of Nature", *Monthly Review*, vol. 56 (6), pp. 1-12.
Foster, John Bellamy (2005) "Organizing Ecological Revolution", *Monthly Review*, vol. 57 (5), pp. 1-10.
Foster, John Bellamy (2008) "The Financialization of Capital and the Crisis", *Monthly Review*, vol. 59 (11), pp. 1-19.
Frank, L., M. Andresen and T. Schmid (2004) "Obesity Relationships with Community Design, Physical Activity, and Time Spent in Cars", *American Journal of Preventive Medicine*, vol. 27 (2), pp. 87-96.
Frankel, S. Herbert (1952) "'Psychic' and 'Accounting' Concepts of Income and Welfare", *Oxford Economic Papers*, vol. 4 (1), pp. 1-17.
Fukuyama, Francis (2007) "A Quiet Revolution. Latin America's Unheralded Progress", *Foreign Affairs* (November/December).
Galbraith, John Kenneth (1987) *The Affluent Society. Fourth Edition*, Harmondsworth, Middlesex, England: Penguin Books, 1958.
Gallaway, Terrel (2005) "Life on the Edge: A Look at Ports of Trade and Other Ecotones", *Journal of Economic Issues*, vol. 39 (3), pp. 707-726.
Garman, Joss (2007) "If I Were ... Aviation Minister", *The Ecologist*, vol. 37 (1), pp. 23-24.
Garrett, Laurie (2007) "The Challenge of Global Health", *Foreign Affairs*, vol. 86 (1), pp. 14-38.
Gasparatos, Alexandros, Mohamed El-Haram and Malcolm Horner (2008) "A Critical Review of Reductionist Approaches for Assessing the Progress Towards Sustainability", *Environmental Impact Assessment Review*, vol. 28 (4-5), pp. 286-311.
Georgescu-Roegen, Nicholas (1965) "Process in Farming Versus Process in Manufacturing: A Problem of Balanced Development", in *Energy and Economic Myths. Institutional and Analytical Economic Essays*, New York: Pergamon Press, pp. 71-102.
Georgescu-Roegen, Nicholas (1969) "The Economics of Production", in *Energy and Economic Myths. Institutional and Analytical Economic Essays*, New York: Pergamon Press, pp. 61-70.
Georgescu-Roegen, Nicholas (1971) *The Entropy Law and the Economic Process*, Cambridge and New York: Harvard University Press.
GGDC (2008) *Total Economy Database*, The Conference Board and Groningen Growth and Development Centre, January 2008, http://www.ggdc.net.
Giddings, Bob, Bill Hopwood and Geoff O'Brien (2002) "Environment, Economy and Society: Fitting Them Together into Sustainable Development", *Sustainable Development*, vol. 10, pp. 187-196.
Gil, Sebastian and Jerzy Sleszynski (2003) "An Index of Sustainable Economic Welfare for Poland", *Sustainable Development*, vol. 11, pp. 47-55.

Gilbert, Milton and George Jaszi (1951) "National Product and Income Statistics as an Aid in Economic Problems", in William Fellner and Bernard Haley (Eds.), *Readings in the Theory of Income Distribution*, Philadelphia and Toronto: The Blankston Company, pp. 44-57 [Originally published in *Dun's Review*, February 1944, pp. 9-11, 32-38].

Gilbert, Milton, George Jaszi, Edward F. Denison and Charles F. Schwartz (1947) "National Income and Product Statistics of the United States", *Supplement to Survey of Current Business*, vol. 27 (7), pp. 1-54.

Gilbert, Milton, George Jaszi, Edward F. Denison and Charles F. Schwartz (1948) "Objectives of National Income Measurement: a Reply to Professor Kuznets", *The Review of Economics and Statistics*, vol. 30 (3), pp. 179-197.

Gomes da Conceição, Cristina and Veronica Montes de Oca Zavala (2004) "Ageing in Mexico: Families, Informal Care and Reciprocity", in Peter Lloyd-Sherlock (Ed.), *Living Longer: Ageing, Development and Social Protection*, London: United Nations Research Institute for Social Development and Zed Books, part III, ch.11.

Gottfried, Robert R. (1994) "Some Reflections on the ISEW", in Clifford Cobb and John B. Cobb Jr. (Eds.), *The Green National Product. A Proposed Index of Sustainable Economic Welfare*, Maryland: University of America Press, pp. 135-146.

Graves, Clyde H. (1939) "A Note on Irving Fisher's Concept of Income", *Econometrica*, vol. 7 (4), pp. 349-356.

Griliches, Zvi (Ed.) (1992) *Output Measurement in the Service Sectors*, Chicago, Illinois: The University of Chicago Press (National Bureau of Economic Research Studies in Income and Wealth).

Gu, Jing, John Humphrey and Dirk Messner (2008) "Global Governance and Developing Countries: The Implications of the Rise of China", *World Development*, vol. 36 (2), pp. 274-292.

Guenno, Giorgio and Silvia Tiezzi (1998) *The Index of Sustainable Economic Welfare (ISEW) for Italy*, University of Siena, Department of Economics. Nota Di Lavoro (Working Paper).

Hagen, Everett E. (1972) "Social Factors in Economic Growth", in O. J. Firestone (Ed.), *Economic Growth Reassessed*, Ottawa: University of Ottawa Press.

Haigh, Matthew and Marc T. Jones (2006) "The Drivers of Corporate Social Responsibility: A Critical Review", *The Business Review*, vol. 5 (2), pp. 245-251.

Hajkowicz, Stefan (2006) "Multi-attributed Environmental Index Construction", *Ecological Economics*, vol. 57, pp. 122-139.

Hamilton, Clive (1997) *The Genuine Progress Indicator: A New Index of Changes in Well-being in Australia*, The Australia Institute, Canberra, Discussion Paper Number 14.

Hamilton, Clive (1999) "The Genuine Progress Indicator Methodological Developments and Results from Australia", *Ecological Economics*, vol. 30, pp. 13-28.

Hamilton, Clive (2003) *Growth Fetish*, Sydney: Allen & Unwin.

Hamilton, Clive and Richard Denniss (2001) *Tracking Well-being in Australia*, The Australia Institute, Discussion Paper, No. 35.

Hansen, James, Reto Ruedy, Makiko Sato and Ken Lo (2007) *Global Annual Temperature Anomalies (Land Meteorological Stations)*, New York: NASA Goddard Institute for Space Studies.

Hansson, Carina Borgström and Mathis Wackernagel (1999) "Rediscovering Place and Accounting Space: How to Re-embed the Human Economy", *Ecological Economics*, vol. 29, pp. 203-213.

Harris, Michael (2007) "On Income, Sustainability and the 'Microfoundations' of the Genuine Progress Indicator", *International Journal of Environment, Workplace and Employment*, vol. 3 (2), pp. 119-131.

Harris, Michael (2008) "Towards Genuine Progress on the Genuine Progress Indicator", *International Journal of Environment, Workplace and Employment*, vol. 4 (1), pp. 82-94.

Harvey, John. T. (2001) "Expectations", in *Encyclopedia of Political Economy*, vol. 1: A-K, London and New York: Routledge, pp. 304-307.

Hayek, Friedrich August (1945) "The Use of Knowledge in Society", *American Economic Review*, vol. 35 (4), pp. 519-530.

Helliwell, John F. (2000) *Balanced Growth: The Scope for National Policies in a Global Economy, Globalisation and International Trade Liberalisation Continuity and Change*, United Kingdom: Edward Elgar.

Hewett, William Wallace (1925) "The Definition of Income", *The American Economic Review*, vol. 15 (2), pp. 239-246.

Hicks, John R. (1939) *Value and Capital: An Inquiry into Some Fundamental Principles of Economic Theory*, Oxford, UK: Oxford University Press.
Hicks, John R. (1948) *Value and Capital,* Second edn, Oxford: Clarendon Press.
Hill, Lewis E. (1990) "The Institutionalist Approach to Social Economics", in Mark A. Lutz (Ed.), *Social Economics: Retrospect and Prospect*, London: Kluwer Academic Publishers.
Hirsch, Fred (1973) "Empty Shelves on the Market Counter", *The Banker*, vol. June.
Hirsch, Fred (1976) *Social Limits to Growth*, London and Henley: Routledge & Kegan Paul.
HKCIC (Hong Kong Christian Industrial Committee) (2003) Integration with Pearl River Delta – Unfair Trade for Unfair Toys. Retrieved: 14 April, 2005, from http://www.cleanclothes.org/publications/HK-Press-Release-10-Jan-2003.pdf.
Hobson, John A. (1914) *Work and Wealth: A Human Valuation*, London: Allen.
Hodgson, Geoffrey M. (2003) "The Hidden Persuaders – Institutions and Individuals in Economic Theory", *Cambridge Journal of Economics*, vol. 27, pp. 159-175.
Hodgson, Geoffrey M. (2004) *Reconstructing Institutional Economics: Evolution, Agency and Structure in American Institutionalism*, London and New York: Routledge.
Holt, Douglas B. (2002) "Why Do Brands Cause Trouble? A Dialectical Theory of Consumer Culture and Branding", *Journal of Consumer Research*, vol. 29 (1), pp. 70-90.
Hong, Vu Xuan Nguyet, Matthew Clarke and Philip A. Lawn (2008) "Genuine Progress in Vietnam: The Impact of the Doi Moi Reforms", in Philip A. Lawn and Matthew Clarke (Eds.), *Sustainable Welfare in the Asia-Pacific*, Cheltenham, UK: Edward Elgar, Ch.11, pp. 299-330.
Hull, C. H. (1899) *The Economic Writings of Sir William Petty*, London: Cambridge.
Hung, Ho-fung (2008) "Rise of China and the Global Overaccumulation Crisis", *Review of International Political Economy*, vol. 15 (2), pp. 149-179.
IMF (2007) *Spillovers and Cycles in the Global Economy (April 2007)*, Washington, D.C.: International Monetary Fund, World Economic Outlook.
IPCC (2007) "Summary for Policymakers", in S. Solomon (Ed.), *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, United Kingdom and New York: Cambridge University Press, Cambridge.
Islam, Sardar M. N. and Matthew Clarke (2002) "The Relationship Between Economic Development and Social Welfare", *Social Indicators Research*, vol. 57, pp. 201-228.
Islam, Sardar M. N. and Matthew Clarke (2005) "The Welfare Economics of Measuring Sustainability: A New Approach Based on Social Choice Theory and Systems Analysis", *Sustainable Development*, vol. 13, pp. 282-296.
Islam, Sardar M. N., Mohan Munasinghe and Matthew Clarke (2003) "Making Long-term Economic Growth More Sustainable: Evaluating the Costs and Benefits", *Ecological Economics*, vol. 47, pp. 149-166.
Jackson, Tim, F. Lating, A. MacGillivray, Nic Marks, J. Ralls and Susanna Stymne (1997) *An Index of Sustainable Economic Welfare for the U.K. 1950–1996*, Guildford: University of Surrey, Centre for Environmental Strategy.
Jackson, Tim and Nic Marks (1994) *Measuring Sustainable Economic Welfare: A Pilot Index for the UK 1950–1990*, Stockholm: Stockholm Environment Institute, New Economics Foundation.
Jackson, Tim, Nat McBride and Nic Marks (2006) *An Index of Sustainable Economic Well-Being*, London: New Economics Foundation.
Jackson, Tim and Susanna Stymne (1996) *Sustainable Economic Welfare in Sweden: A Pilot Index: 1950–1992*, Stockholm: *Stockholm Environmental Institute*.
Jackson, William A. (2005) "Capabilities, Culture and Social Structure", *Review of Social Economy*, vol. 63 (1), pp. 101-124.
Jenkins, Rhys, Enrique Dussel Peters and Mauricio Mesquita Moreira (2008) "The Impact of China on Latin America and the Caribbean", *World Development*, vol. 36 (2), pp. 235-253.
Just, R. E., D. L. Hueth and A. Schmitz (2004) *Applied Welfare Economics and Public Policy*, Cheltenham, U. K.: Edward Elgar.
Kaplinsky, Raphael and Mike Morris (2008) "Do the Asian Drivers Undermine Export-oriented Industrialization in SSA?", *World Development*, vol. 36 (2), pp. 254-273.
Kapuria-Foreman, Vibha and Mark Perlman (1995) "An Economic Historian's Economist: Remembering Simon Kuznets", *The Economic Journal*, vol. 105 (November), pp. 1524-1547.
Kendrick, John W (1970) "The Historical Development of National-Income Accounts", *History of Political Economy*, vol. 2 (2), pp. 284-315.
Kettell, Steven (2006) "Circuits of Capital and Overproduction: A Marxist Analysis of the Present World Economic Crisis", *Review of Radical Political Economics*, vol. 38 (24), pp. 24-44.

Keynes, John Maynard (1936) *The General Theory of Employment Interest and Money*, San Diego: Harvest/HBJ Book, 1953.
Keynes, John Maynard (1937) "The General Theory of Employment", *The Quarterly Journal of Economics*, vol. 51 (2), pp. 209-223.
King, Willford I. (1915) *The Wealth and Income of the People of the United States*, New York: The Macmillan Company.
King, Willford I. (1925) "Income and Wealth", *The American Economic Review*, vol. 15 (3).
King, Willford I. (1930) *National Income and its Purchasing Power*, New York: National Bureau of Economic Research.
Kingsnorth, Paul (2005) "Neighbourless Hoods", *The Ecologist*, vol. 35 (9), pp. 40-47.
Kingsnorth, Paul (2006) "A Call To Arms", *The Ecologist*, vol. 36 (9), pp. 50-55.
Kirby, Peadar (2006) "Theorising Globalisation's Social Impact: Proposing the Concept of Vulnerability", *Review of International Political Economy*, vol. 13 (4), pp. 632-655.
Klein, Lawrence R. (1969) "Theories of Effective Demand and Employment", in David Horowitz (Ed.), *Marx and Modern Economics*, London and New York: Monthly Review Press, pp. 138-175.
Knox, Francis (2005) "The Doctrine of Consumers' Sovereignty", *Review of Social Economy*, vol. 63 (3), pp. 383-395.
Kuznets, Simon (1933) "National Income", in *Encyclopedia of the Social Sciences*, vol. 11, New York: The Macmillan Company, pp. 205-224.
Kuznets, Simon (1947) "Measurement: Measurement of Economic Growth", *The Journal of Economic History*, vol. 7 (Supplement: Economic Growth: A Symposium), pp. 10-34.
Kuznets, Simon (1948) "Discussion of the New Department of Commerce Income Series", *Review of Economics and Statistics*, vol. 30 (3), pp. 151-179.
Kuznets, Simon (1955) "Economic Growth and Income Inequality", *American Economic Review*, vol. 45 (1), pp. 1-28.
Kuznets, Simon (1966) *Modern Economic Growth: Rate, Structure, and Spread*, New Haven, CT: Yale University.
Lange, Glenn-Marie, Eric Mungatana and Rashid Hassan (2007) "Water Accounting for the Orange River Basin: Managing a Transboundary Resource", *Ecological Economics*, vol. 61, pp. 660-670.
Lareau, Annette (2002) "Invisible Inequality: Social Class and Childrearing in Black Families and White Families", *American Sociological Review*, vol. 67 (5), pp. 747-779.
Lavoie, Marc (1992) *Foundations of Post-Keynesian Economic Analysis*, Aldershot: Edward Elgar.
Lawn, Philip A. (2001) *Toward Sustainable Development: An Ecological Economics Approach*, Boca Raton: Lewis Publishers.
Lawn, Philip A. (2003) "A Theoretical Foundation to Support the Index of Sustainable Economic Welfare (ISEW), Genuine Progress Indicator (GPI), and Other Related indexes", *Ecological Economics*, vol. 44, pp. 105-118.
Lawn, Philip A. (2004a) "How Well are Resource Prices Likely to Serve as Indicators of Natural Resource Scarcity", *International Journal of Sustainable Development*, vol. 7 (4), pp. 369-397.
Lawn, Philip A. (2004b) "Using the Fisherian Concept of Income to Guide a Nation's Macro-Investment Policy", *International Journal of Sustainable Development*, vol. 3 (3/4), pp. 339-352.
Lawn, Philip A. (2005) "An Assessment of the Valuation Methods Used to Calculate the Index of Sustainable Economic Welfare (ISEW), Genuine Progress Indicator (GPI), and Sustainable Net Benefit Index (SNBI)", *Environment, Development and Sustainability*, vol. 7, pp. 185-208.
Lawn, Philip A. (2006a) "An Assessment of Alternative Measures of Sustainable Economic Welfare", in Philip A. Lawn (Ed.), *Sustainable Development Indicators in Ecological Economics*, Cheltenham, UK: Edward Elgar, pp. 139-165.
Lawn, Philip A. (2006b) "Sustainable Development: Concept and Indicators", in Philip A. Lawn (Ed.), *Sustainable Development Indicators in Ecological Economics*, Cheltenham, UK: Edward Elgar, pp. 13-54.
Lawn, Philip A. (2006c) "Using the Fisherian Concept of Income to Guide a Nation's Transition to a Steady-State Economy", *Ecological Economics*, vol. 56, pp. 440-453.
Lawn, Philip A. (2007a) *Frontier Issues in Ecological Economics*, Cheltenham, UK: Edward Elgar.
Lawn, Philip A. (2007b) "A Stock-Take of Green National Accounting Initiatives", *Social Indicators Research*, vol. 80, pp. 427-460.

Lawn, Philip A. (2008a) "Genuine Progress in Australia: Time to Rethink the Growth Objective", in Philip A. Lawn and Matthew Clarke (Eds.), *Sustainable Welfare in the Asia-Pacific*, Cheltenham, UK: Edward Elgar, Ch.5, pp. 91-125.
Lawn, Philip A. (2008b) "Genuine Progress in India: Some Further Growth Needed in the Immediate Future but Population Stabilisation Needed Immediately", in Philip A. Lawn and Matthew Clarke (Eds.), *Sustainable Welfare in the Asia-Pacific*, Cheltenham, UK: Edward Elgar, Ch.8, pp. 191-227.
Lawn, Philip A. (2008c) "How Much Progress Has Been Recently Made in India? Finding Out With the Use of a Genuine Progress Indicator", *International Journal of Environment and Sustainable Development*, vol. 7 (3), pp. 311-331.
Lawn, Philip A. (2008d) "Response to "On Income, Sustainability and the 'Microfoundations' of the GPI"", *International Journal of Environment, Workplace and Employment*, vol. 4 (1), pp. 59-81.
Lawn, Philip A. (2009) "Review of Sustainability Indicators: A Scientific Assessment", in Tomáš Hák, Bedřich Moldan and Arthur Lyon Dahl (Eds.), *Ecological Economics*, vol. 68, doi:10.1016/j.ecolecon.2008.11.004 (Book Review), pp. 1899-1900.
Lawn, Philip A. and Matthew Clarke (2006a) "Comparing Victoria's Genuine Progress with that of the Rest-of-Australia", *Journal of Economic and Social Policy*, vol. 10 (2), pp. 115-138.
Lawn, Philip A. and Matthew Clarke (2006b) *Measuring Genuine Progress: An Application of the Genuine Progress Indicator*, New York: Nova Science Publishers, Inc.
Lawn, Philip A. and Matthew Clarke (2008a) "Genuine Progress Across the Asia-Pacific Region: Comparisons, Trends, and Policy Implications", in Philip A. Lawn and Matthew Clarke (Eds.), *Sustainable Welfare in the Asia-Pacific*, Cheltenham, UK: Edward Elgar, Ch.12, pp. 333-361.
Lawn, Philip A. and Matthew Clarke (2008b) "In Defence of the Genuine Progress Indicator", in Philip A. Lawn and Matthew Clarke (Eds.), *Sustainable Welfare in the Asia-Pacific*, Cheltenham, UK: Edward Elgar, Ch.4, pp. 69-88.
Lawn, Philip A. and Matthew Clarke (2008c) "An Introduction to the Asia-Pacific Region", in Philip A. Lawn and Matthew Clarke (Eds.), *Sustainable Welfare in the Asia-Pacific*, Cheltenham, UK: Edward Elgar, Ch.1, pp. 3-34.
Lawn, Philip A. and Matthew Clarke (2008d) *Sustainable Welfare in the Asia-Pacific: Studies Using the Genuine Progress Indicator*, Cheltenham, UK: Edward Elgar.
Lawn, Philip A. and Matthew Clarke (2008e) "What is the Genuine Progress Indicator and How is it Typically Calculated?", in Philip A. Lawn and Matthew Clarke (Eds.), *Sustainable Welfare in the Asia-Pacific*, Cheltenham, UK: Edward Elgar, Ch.3, pp. 47-68.
Lawn, Philip A. and Matthew Clarke (2008f) "Why is Gross Domestic Product an Inadequate Indicator of Sustainable Welfare? ", in Philip A. Lawn and Matthew Clarke (Eds.), *Sustainable Welfare in the Asia-Pacific*, Cheltenham, UK: Edward Elgar, Ch.2, pp. 35-46.
Lawn, Philip A. and Richard D. Sanders (1999) "Has Australia Surpassed its Optimal Macroeconomic Scale? Finding Out with the Aid of 'Benefit' and 'Cost' Accounts and a Sustainable Net Benefit Index", *Ecological Economics*, vol. 28, pp. 213-229.
Lawson, Tony (1989) "Abstraction, Tendencies and Stylised Facts: A Realistic Approach to Economic Analysis", *Cambridge Journal of Economics*, vol. 13 (1), pp. 59-78.
Lawson, Tony (1997) *Economics and Reality*, London: Routledge.
Lawson, Tony (2006) "The Nature of Heterodox Economics", *Cambridge Journal of Economics*, vol. 30, pp. 483-505.
Lee, T. A. (1979) "The Contribution of Fisher to Cash Flow Accounting", *Journal of Business Finance and Accounting*, vol. 6 (3), pp. 321-330.
Leipert, Christian (1986) "Social Costs of Economic Growth", *Journal of Economic Issues*, vol. 20 (1), pp. 109-131.
Leipert, Christian (1989a) "National Income and Economic Growth: The Conceptual Side of Defensive Expenditures", *Journal of Economic Issues*, vol. 23 (3), pp. 843-856.
Leipert, Christian (1989b) "Social Costs of the Economic Process and National Accounts: The Example of Defensive Expenditures", *The Journal of Interdisciplinary Economics*, vol. 3, pp. 27-46.
Lequiller, François (2005) "Is GDP a Satisfactory Measure of Growth?", *OECD Observer* (246-247, December 2004–January 2005).
Li, Minqi (2008) "An Age of Transition: The United States, China, Peak Oil, and the Demise of Neoliberalism", *Monthly Review*, vol. 59 (11), pp. 20-34.
Lin, Brian Chi-ang (2006) "A Sustainable Perspective on the Knowledge Economy: A Critique of Austrian and Mainstream Views", *Ecological Economics*, vol. 60, pp. 324-332.

Lin, Brian Chi-ang (2007) "A New Vision of the Knowledge Economy", *Journal of Economic Surveys*, vol. 21 (3), pp. 553-584.
Lippit, Victor D. (1992) "Reevaluating the Concept of the Surplus", in John B. Davis (Ed.), *The Economic Surplus in Advanced Economies*, England: Edward Elgar, pp. 71-89.
Lippit, Victor D. (2007) *Capitalism*, New York: Routledge.
Lopez, J. Humberto and Guillermo Perry (2008) *Inequality in Latin America – Determinants and Consequences*, World Bank Policy Research Working Paper, No. 4504. February, Washington, D.C.: World Bank, Latin America and Caribbean Region.
Maddison, Angus (1981) "Growth, Population and Income Distribution: Selected Essays", *The Economic Journal*, vol. 91 (364), pp. 1048-1049.
Maddison, Angus (2006) *The World Economy Volume 2: Historical Statistics*, Paris, France: Development Centre Studies, Organisation for Economic Co-operation and Development (OECD).
Mager, Nathan H. (1987) *The Kondratieff Waves*, New York: Praeger Publishers.
Makino, Matsuyo (2008) "Genuine Progress in Japan and the Need for an Open Economy GPI", in Philip A. Lawn and Matthew Clarke (Eds.), *Sustainable Welfare in the Asia-Pacific*, Cheltenham, UK: Edward Elgar, Ch.7, pp. 153-190.
Mamalakis, Markos J. (1996) "Misuse and Use of National Accounts as a Welfare Indicator: Selected Analytical and Measurement Issues", *Review of Income and Wealth*, vol. 42 (3), pp. 293-320.
Mandel, Ernest (1995) *Long Waves of Capitalist Development: A Marxist Interpretation,* Second Edition edn, London and New York: Verso.
Mann, Stefan (2008) "Framing Obesity in Economic Theory and Policy", *Review of Social Economy*, vol. 66 (2), pp. 163-179.
Marland, G., T.A. Boden and R. J. Andres (2008) *Global, Regional, and National CO_2 Emissions. In Trends: A Compendium of Data on Global Change*, Oak Ridge, Tenn., U.S.A.: Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory, U.S. Department of Energy.
Marx, Karl (1857-58) *Grundrisse: Foundations of the Critique of Political Economy (Rough Draft)*, Harmondsworth: Penguin, 1973. Translated with a Foreword by Martin Nicolaus. (First published in 1939 in German.).
Marx, Karl (1867) *Capital: A Critique of Political Economy: Volume 1*, Harmondsworth: Penguin, 1976. Introduced by Ernest Mandel and Translated by Ben Fowkes.
Marx, Karl (1909) *Capital: Volume 3*, Chicago: Charles H. Kerr.
Max-Neef, Manfred (1995) "Economic Growth and Quality of Life: A Threshold Hypothesis", *Ecological Economics*, vol. 15, pp. 115-118.
McDonough, Terrence (2008) "Social Structures of Accumulation Theory: The State of the Art", *Review of Radical Political Economics*, vol. 40 (2), pp. 153-173.
Mellor, Mary and Paul Langley (2002) "'Economy', Sustainability and Sites of Transformative Space", *New Political Economy*, vol. 7 (1), pp. 49-65.
Migone, Andrea (2007) "Hedonistic Consumerism: Patterns of Consumption in Contemporary Capitalism", *Review of Radical Political Economics*, vol. 39 (2), pp. 173-200.
Minsky, Hyman P. (1975) *John Maynard Keynes*, New York: Columbia University Press.
Mishan, E. J. (1967) *The Costs of Economic Growth*, Harmondsworth, Middlesex, England: Penguin Books.
Mishan, E. J. (1980) *Pornography, Psychedelics & Technology, Essays on the Limits to Freedom*, London: George Allen & Unwin.
Mishan, E. J. (1994) "Is a Welfare Index Possible?", in Clifford Cobb and John B. Cobb Jr. (Eds.), *The Green National Product*, Boston: University Press of America.
Mishan, E. J. and Euston Quah (2007) *Cost-Benefit Analysis. Fifth Edition*, London and New York: Routledge.
Mitchell, Ross E. (2001) "Thorstein Veblen: Pioneer in Environmental Sociology", *Organization & Environment*, vol. 14 (4), pp. 389-408.
Mitchell, Wesley C. (1947) *Business Cycles: The Problem and its Setting*, New York: The National Bureau of National Economic Research, 1927.
Moffatt, I. and M.D. Wilson (1994) "An Index of Sustainable Economic Welfare for Scotland, 1980–1991", *International Journal of Sustainable Development and World Ecology*, vol. 1, pp. 264-291.
Monbiot, George (2005) "The Most Destructive Crop on Earth Is No Solution to the Energy Crisis", *The Guardian*, Tuesday, December 6.

Monfreda, Chad, Mathis Wackernagel and Diana Deumling (2004) "Establishing National Natural Capital Accounts Based on Detailed Ecological Footprint and Biological Capacity Assessment", *Land Use Policy*, vol. 21, pp. 231-246.
Moore, G. E. (1959) "A Defense of Common Sense", in G. E. Moore (Ed.), *Philosophical Papers*, London: Allen and Unwin, pp. 52-59.
Moreira, Mauricio Mesquita (2007) "Fear of China: Is There a Future for Manufacturing in Latin America?", *World Development*, vol. 35 (3), pp. 355-376.
Muir, Tony and Mike Zegarac (2001) "Societal Costs of Exposure to Toxic Substances: Economic and Health Costs of Four Case Studies that are Candidates for Environmental Causation", *Environmental Health Perspectives*, vol. 109 (6), pp. 885-903.
Munda, Giussepe (2005) "'Measuring Sustainability' – A Multi-Criterion Framework", *Environment, Development and Sustainability*, vol. 7, pp. 117-134.
Myrdal, Gunnar (1944) *An American Dilemma: The Negro Problem and Modern Democracy*, New York: Pantheon Books.
Myrdal, Gunnar (1968) *Asian Drama: An Inquiry into the Poverty of Nations*, Harmondsworth, Middlesex: Penguin Books.
Nearing, Scott (1915) *Income: An Examination of the Returns for Services Rendered and from Property Owned in the United States*, New York: The Macmillan Company.
Nelson, Anitra (2001) "The Poverty of Money: Marxian Insights for Ecological Economics", *Ecological Economics*, vol. 36, pp. 499-511.
Neri, Frank and Paul Bradstreet (2006) "Comment on "Measuring Victoria's Genuine Progress: A Genuine Progress Indicator (GPI) for Victoria"", *Economic Papers*, vol. 25 (3), pp. 295-297.
Neumayer, Eric (1999) "The ISEW – Not an Index of Sustainable Economic Welfare", *Social Indicators Research*, vol. 48, pp. 77-101.
Neumayer, Eric (2000) "On the Methodology of ISEW, GPI and Related Measures: Some Constructive Suggestions and Some Doubt on the 'Threshold' Hypothesis", *Ecological Economics*, vol. 34, pp. 347-361.
Neumayer, Eric (2003) *Weak versus Strong Sustainability: Exploring the Limits of Two Opposing Paradigms*, Northampton: Edward Elgar.
Neumayer, Eric (2004) "Sustainability and Well-being Indicators", *UNU-WIDER Research Paper*, vol. 2004/23.
Neumayer, Eric (2007) "RE: Theoretical Foundations of the ISEW, GPI, SNBI", Personal Communication (E-mail) to Andrew John Brennan, Monday, 9th July, 2007.
Ng, Yew-Kwang (2003) "From Preference to Happiness: Towards a More Complete Welfare Economics", *Social Choice and Welfare*, vol. 20, pp. 307-350.
Niccolucci, Valentina, Federico Maria Pulselli and Enzo Tiezzi (2007) "Strengthening the Threshold Hypothesis: Economic and Biophysical Limits to Growth", *Ecological Economics*, vol. 60, pp. 667-672.
Nijkamp, P., S.A. Rienstra and J.M. Vleugel (1998) *Transportation Planning and the Future*, Chichester: Wiley.
Nolan, P., R. Huaichuan and Alan Shipman (2004) "Coal Liquefaction, Shenhua Group, and China's Energy Security", *European Management Journal*, vol. 22 (2).
Nordhaus, William D. (1977) "Economic Growth and Climate: The Case of Carbon Dioxide", *The American Economic Review* (May).
Nordhaus, William D. (1998) "Reflections on the Concept of Sustainable Economic Growth", *Cowles Foundation Paper* (951).
Nordhaus, William D. (2005) "Irving Fisher and the Contribution of Improved Longevity to Living Standards", *The American Journal of Economics and Sociology*, vol. 64 (1), pp. 367-392.
Nordhaus, William D. and James Tobin (1971) *Is Growth Obsolete?* Cowles Foundation Discussion Paper No. 319, October 7, 1971 [For NBER Colloquium San Francisco, December 10, 1970].
Nordhaus, William D. and James Tobin (1972) "Is Growth Obsolete?", in Milton Moss (Ed.), *The Measurement of Economic and Social Performance. Conference Research Studies in Income and Wealth*, New York: Columbia University Press, pp. 509-532.
Nourry, Myriam (2008) "Measuring Sustainable Development: Some Empirical Evidence for France from Eight Alternative Indicators", *Ecological Economics*, vol. 67, pp. 441-456.
O'Boyle, Edward J. (2000) "Personalist Economics: Moral Convictions, Economic Realities, and Social Action", *Review of Social Economy*, vol. 58 (4), pp. 539-552.
O'Boyle, Edward J. (2005) "Homo Socio-Economicus – Foundational to Social Economics and the Social Economy", *Review of Social Economy*, vol. 63 (3), pp. 483-507.

O'Connor, James, R. (1998) *Natural Causes: Essays in Ecological Marxism*, New York: Guilford Press.
O'Connor, M., S. Faucheux, G. Froger, S.O. Funtowicz and G. Munda (1996) "Emergent Complexity and Procedural Rationality: Postnormal Science for Sustainability", in R. Costanza, O. Segura and J. Martinez-Alier (Eds.), *Getting Down to Earth: Practical Applications of Ecological Economics*, Washington, D.C.: Island Press/ISEE, pp. 223-248.
O'Connor, Martin (1994) "On the Misadventures of Capitalist Nature", in Martin O'Connor (Ed.), *Is Capitalism Sustainable?*, New York: Guilford, pp. 125-151.
O'Hara, Phillip Anthony (2000) *Marx, Veblen, and Contemporary Institutional Political Economy: Principles and Unstable Dynamics of Capitalism*, Cheltenham, UK and Northampton, US: Edward Elgar.
O'Hara, Phillip Anthony (2001a) "Wealth Distribution and Global Inequality in the Multiple Capital Paradigm", *International Journal of Human Development*, vol. 1 (1), pp. 121-140.
O'Hara, Phillip Anthony (2004) "A New Family-Community Social Structure of Accumulation for Long Wave Upswing in the United States?", *Forum for Social Economics*, vol. 33 (2), pp. 51-80.
O'Hara, Phillip Anthony (2005) "Contradictions of Neoliberal Globalisation: The Importance of Ideologies and Values in Political Economy", *The Journal of Interdisciplinary Economics*, vol. 16, pp. 341-365.
O'Hara, Phillip Anthony (2006a) "A Chinese Social Structure of Accumulation for Capitalist Long-Wave Upswing?", *Review of Radical Political Economics*, vol. 38 (3), pp. 397-404.
O'Hara, Phillip Anthony (2006b) "The Contradictory Dynamics of Globalization", in B. N. Ghosh (Ed.), *Globalization and the Third World. A Study of Negative Consequences*, New York: Palgrave Macmillan.
O'Hara, Phillip Anthony (2006c) *Growth and Development in the Global Political Economy: Social Structures of Accumulation and Modes of Regulation*, London and New York: Routledge.
O'Hara, Phillip Anthony (2006d) *Karl Marx on the Contradictory Dynamics of Capitalism: Innovation, Globalisation and Competition in the Grundrisse*, Global Political Economy Research Unit, Working Paper.
O'Hara, Phillip Anthony (2007a) "Heterodox Political Economy Specialization and Interconnection – Concepts of Contradiction, Heterogeneous Agents, Uneven Development", *Intervention*, vol. 4 (1), pp. 103-124.
O'Hara, Phillip Anthony (2007b) "Principles of Institutional-Evolutionary Political Economy – Converging Themes from the Schools of Heterodoxy", *Journal of Economic Issues*, vol. 40 (1), pp. 1-41.
O'Hara, Phillip Anthony (2008a) "Can the Principles of Heterodox Political Economy Explain its own Re-emergence and Development?", *On The Horizon*, vol. 16 (4), pp. 260-278.
O'Hara, Phillip Anthony (2008b) "A Social Structure of Accumulation for Long Wave Upswing in Australia?", *Journal of Australian Political Economy*, vol. 61 (June), pp. 88-111.
O'Hara, Phillip Anthony (2010) "A Myrdalian Holistic Perspective on Global and Regional Performance and Uneven Development", *Journal of Economic Issues*, vol. 64.
O'Hara, Rhoda Adelaide and Phillip Anthony O'Hara (2001) "Household Labor", in Phillip Anthony O'Hara (Ed.), *Encyclopedia of Political Economy*, vol. 1: A-K, London and New York: Routedge, pp. 457-459.
O'Hara, Sabine U. (1995) "Sustainability: Social and Ecological Dimensions", *Review of Social Economy* (LIII), pp. 529-551.
O'Hara, Sabine U. (1998) "Internalizing Economics – Sustainability Between Matter and Meaning", *International Journal of Social Economics*, vol. 25 (2/3/4), pp. 175-195.
O'Hara, Sabine U. (2001b) "The Challenges of Valuation: Ecological Economics Between Matter and Meaning", in Robert Costanza, Cutler J. Cleveland and David I. Stern (Eds.), *The Economics of Nature and the Nature of Economics*, Cheltenham, UK: Edward Elgar, pp. 89-108.
O'Hara, Sabine U. (2009) "Feminist Ecological Economics in Theory and Practice", in Ariel Salleh (Ed.), *Eco-Sufficiency and Global Justice: Women Write Political Ecology*, London: Pluto Press, pp. 180-196.
O'Neill, John O (1973) *Modes of Individualism and Collectivism*, London: Heinemann.
Ocampo, José Antonio (2005) "The Quest for Dynamic Efficiency: Structural Dynamics and Economic Growth in Developing Countries", in José Antonio Ocampo (Ed.), *Beyond Reforms: Structural Dynamics and Macroeconomic Vulnerability*, Palo Alto, California, and Washington D.C.: Stanford Economics and Finance, Stanford University Press, and World Bank.

OECD (2008) *OECD Environmental Outlook to 2030*, Paris: Organisation of Economic Co-operation and Development.
Okun, Arthur M. (1971) "Social Welfare Has No Price Tag", in *Survey of Current Business*, United States Department of Commerce, 50th Anniversary Issue, July 1971.
Palat, Ravi Arvind (2008) "A New Bandung? Economic Growth vs. Distributive Justice Among Emerging Powers", *Futures*, vol. 40 (8), pp. 721-734.
Paxton, Pamela (2007) "Association Memberships and Generalized Trust: A Multilevel Model Across 31 Countries", *Social Forces*, vol. 86 (1), pp. 47-76.
Perelman, Michael (2008) "The Corrosive Qualities of Inequality – The Roots of the Current Meltdown", *Challenge*, vol. 51 (5), pp. 40-64.
Perlman, Mark and Morgan Marietta (2005) "The Politics of Social Accounting: Public Goals and the Evolution of the National Accounts in Germany, the United Kingdom and the United States", *Review of Political Economy*, vol. 17 (2), pp. 211-230.
Pigou, Arthur Cecil (1932) *The Economics of Welfare. Fourth Edition*, New York: AMS Press Inc., 1978.
Pimentel, David, Bonnie Berger, David Filiberto, Michelle Newton, Benjamin Wolfe, Elizabeth Karabinakis, Steven Clark, Elaine Poon, Elizabeth Abbett and Sudha Nandagopal (2004) "Water Resources: Agricultural and Environmental Issues", *BioScience*, vol. 54 (10), p. 909(10).
Podkaminer, Leon (2006) "External Liberalization, Growth and Distribution: The Polish Experience", in Lance Taylor (Ed.), *External Liberalization in Asia, Post-Socialist Europe, and Brazil*, New York: Oxford University Press.
Pol, Enric (1996) *City, Identity and Sustainability (CIS). Research Project*, Barcelona, Spain: University of Barcelona (Report of the CIS Network research).
Polanyi, Karl (1944, 2001) *The Great Transformation*, Boston, Mass.: Beacon Press.
Polanyi, Karl (1957) *The Great Transformation*, Boston, Mass.: Beacon Press, 1944, 2001.
Polanyi, Karl (1992) "The Economy as an Instituted Process", in Mark Granovetter and Richard Swedberg (Eds.), *The Sociology of Economic Life*, New York: Westview Press.
Polanyi, Karl, C. M. Arensberg and H. W. Pearson (1971) *Trade and Markets in the Early Empires*, Chicago: Henry Regnery.
Power, Thomas Michael (1994) "Measuring Local Economic Well-being: Per Capita Income and Local Economic Health", in Clifford W. Cobb and John B. Cobb Jr. (Eds.), *The Green National Product – A Proposed Index of Sustainable Economic Welfare*, Lanham and New York: University of America.
Prochowicz, Robert and Jerzy Sleszynski (2006) *The Index of Sustainable Economic Welfare Revisited for Poland in Transition*, Revista Internacional de Sostenibilidad, Tecnología y Humanismo. Número 1. Año.
Pulselli, Federico Maria, Francesca Ciampalini, Enzo Tiezzi and Carlo Zappia (2006) "The Index of Sustainable Economic Welfare (ISEW) for a Local Authority: A Case Study in Italy", *Ecological Economics*, vol. 60, pp. 271-281.
Putman, Robert D. (2000) *Bowling Alone: The Collapse and Revival of American Community*, New York: Simon and Schuster.
Rankin, Aidan (2006) "The Elephant in the Room", *The Ecologist*, vol. 36 (10), pp. 24-27.
Rawls, John (1971) *A Theory of Justice*, Cambridge, MA: Harvard University Press.
Read, Daniel (2007) "Experienced Utility: Utility Theory from Jeremy Bentham to Daniel Kahneman", *Thinking & Reasoning*, vol. 13 (1), pp. 45-61.
Rees, William E. and Mathis Wackernagel (1999) "Monetary Analysis: Turning a Blind Eye on Sustainability", *Ecological Economics*, vol. 29, pp. 47-52.
Resnick, Stephen A. and Richard D. Wolff (1987) *Knowledge and Class. A Marxian Critique of Political Economy*, Chicago and London: The University of Chicago Press.
Resnick, Stephen A. and Richard D. Wolff (2001) "Determinism and Overdetermination", in Phillip Anthony O'Hara (Ed.), *Encyclopedia of Political Economy*, London and New York: Routledge.
Resnick, Stephen A. and Richard D. Wolff (2005) "The Point and Purpose of Marx's Notion of Class", *Rethinking Marxism*, vol. 17 (1), pp. 33-37.
Rezabakhsh, Behrang, Daniel Bornemann, Ursula Hansen and Ulf Schrader (2006) "Consumer Power: A Comparison of the Old Economy and the Internet Economy", *Journal of Consumer Policy*, vol. 29, pp. 3-36.
Ridder, Knight (2006) "Wal-Mart Unions in China to be Controlled by Government, Lack Free Elections", *Washington Bureau*, August 16, 2006.

Roddick, Anita (2004) "If Shirts Could Only Speak ... If We Would Only Listen", *The Ecologist*, vol. 34 (6), pp. 23-27.
Rodrigues, João (2004) "Endogenous Preference and Embeddedness: A Reappraisal of Karl Polanyi", *Journal of Economic Issues*, vol. 38 (1), pp. 189-200.
Røpke, Inge (1999) "Prices are Not Worth Much", *Ecological Economics*, vol. 29, pp. 45-46.
Rosen, Ellen Israel (2002) *Making Sweatshops. The Globalization of the U.S. Apparel Industry*, Berkeley and Los Angeles: University of California Press.
Rosenberg, David, Tammo Oegema and Marcel Bovy (1995) *ISEW for Netherlands: Preliminary Results and Some Proposals for Further Research*, Amsterdam: ISMA, Instituut Voor Milieu- En Systeemanalyse.
Ross, Robert J. S. (2004) *Slaves to Fashion. Poverty and Abuse in the New Sweatshops*, Ann Arbor: University of Michigan Press.
Rubik, Frieder (1985) "Das Bruttosozialprodukt als Indikator für Lebensqualität? Kritik und Alternativen", in Projektgruppe Ökologische Wirtschaft (Ed.), *Arbeiten im Einklang mit der Natur*, Freiburg i.Brsg: Dreisam-Verlag, pp. 145-176.
Sagoff, Mark (2003) "On the Relation Between Preference and Choice", *Journal of Socio-Economics*, vol. 31, pp. 587-598.
Salleh, Ariel (2009) "From Eco-Sufficiency to Global Justice", in Ariel Salleh (Ed.), *Eco-Sufficiency and Global Justice: Women Write Political Ecology*, London: Pluto Press, pp. 291-312.
Schieber, George J., Pablo Gottret, Lisa K. Fleisher and Adam A. Leive (2007) "Financing Global Health: Mission Unaccomplished", *Health Affairs*, vol. 26 (4), pp. 921-934.
Schnaiberg, A. and K. A. Gould (1994) *Environment and Society: The Enduring Conflict*, New York: St. Martin's.
Schor, Juliet B. (2005) "Prices and Quantities: Unsustainable Consumption and the Global Economy", *Ecological Economics*, vol. 55, pp. 309-320.
Schumpeter, Joseph Alois (1911) *The Theory of Economic Development*, Cambridge: Cambridge University Press, 1961.
Schumpeter, Joseph Alois (1939) *Business Cycles: A Theoretical, Historical and Statistical Analysis of the Capitalist Process*, New York: McGraw-Hill.
Schumpeter, Joseph Alois (1943) *Capitalism, Socialism, and Democracy*, Chatham, Kent: George Allen & Unwin, 1976.
Schwartzman, David (2008) "The Limits to Entropy: Continuing Misuse of Thermodynamics in Environmental and Marxist Theory", *Science & Society*, vol. 72 (1), pp. 43-62.
Sen, Amartya K. (1966) "A Possibility Theorem on Majority Decisions", *Econometrica*, vol. 34 (2), pp. 491-509.
Sen, Amartya K. (1970a) *Collective Choice and Social Welfare*, Amsterdam: North Holland Publishing Co.
Sen, Amartya K. (1970b) "Interpersonal Aggregation and Partial Comparability", *Econometrica*, vol. 38 (3), pp. 393-409.
Sen, Amartya K. (1993) "Capability and Well-Being", in Martha C. Nussbaum and Amartya K. Sen (Eds.), *The Quality of Life* Clarendon Press.
Sen, Amartya K. (1997) *On Economic Inequality. Expanded Edition*, Oxford: Oxford University Press.
Sen, Amartya K. (1999) "The Possibility of Social Choice", *The American Economic Review*, vol. June, pp. 349-366.
Shaikh, Anwar and E. Ahmet Tonak (1994) *Measuring the Wealth of Nations: The Political Economy of National Accounts*, Cambridge: Cambridge University Press.
Sherman, Howard J. (1991) *The Business Cycle: Growth and Crisis in Capitalism*, New Jersey: Princeton University Press.
Sherman, Howard J. (2003) "Institutions and the Business Cycle", *Journal of Economic Issues*, vol. 37 (3), pp. 621-642.
Shipman, Alan (2001) "Privatized Production, Socialized Consumption? Old Producer Power Behind the New Consumer Sovereignty", *Review of Social Economy*, vol. 59 (3), pp. 331-352.
Shipman, Alan (2004) "Lauding the Leisure Class: Symbolic Content and Conspicuous Consumption", *Review of Social Economy*, vol. 62 (3), pp. 277-289.
Siebert, Horst (2007) "China: Coming to Grips with the New Global Player", *The World Economy*, vol. 30 (6), pp. 893-922.
Silver, Beverly (1992) "Class Struggle and Kondratieff Waves", in Alfred Kleinknecht, Ernest Mandel and Immanuel Wallerstein (Eds.), *New Findings in Long-Wave Research*, London and New York: Macmillan and St. Martins Press, pp. 279-295.

Sirgy, M. Joseph and Chenting Su (2000) "The Ethics of Consumer Sovereignty in an Age of High Tech", *Journal of Business Ethics*, vol. 28, pp. 1-14.
Slesnick, Daniel T. (1998) "Empirical Approaches to the Measurement of Welfare", *Journal of Economic Literature*, vol. 36 (4), pp. 2108-2065.
Smith, Adam (1759) *The Theory of Moral Sentiments*, Oxford: Oxford University Press, 1976.
Smith, Adam (1776) *An Enquiry into the Nature and Causes of the Wealth of Nations*, Oxford: Oxford University Press, 1976.
Smith, Jeremy (2005) "Starry Starry Nights", *The Ecologist*, vol. 35 (9), pp. 56-62.
Smith, Robert (2007) "Development of the SEEA 2003 and its Implementation", *Ecological Economics*, vol. 61, pp. 592-599.
Soanes, Catherine and Angus Stevenson (2004) *Concise Oxford English Dictionary Eleventh Edition*, Oxford: Oxford University Press.
Spahr, Charles (1896) *The Present Distribution of Wealth in the United States*, New York: Thomas Y. Crowell & Company.
Stahel, Andri W. (1999) "Time Contradictions of Capitalism", *Capitalism Nature Socialism*, vol. 10, pp. 101-132.
Stahel, Andri W. (2005) "Value from a Complex Dynamic System's Perspective", *Ecological Economics*, vol. 54, pp. 370-381.
Stahel, Andri W. (2006) "Ecological Complexity: Complexity, Oikonomía and Political Economy", *Ecological Complexity*, vol. 3 (4), pp. 369-381.
Stanfield, James Ronald (1986) *The Economic Thought of Karl Polanyi: Lives and Livelihood*, New York: St. Martin's Press.
Stanfield, James Ronald and Michael Carroll (1997) "The Monopoly Capital School and Original Institutionalist Economics", *Journal of Economic Issues*, vol. 31 (2), pp. 481-489.
Stanfield, James Ronald and Jacqueline Bloom Stanfield (1997) "Where Has Love Gone? Reciprocity, Redistribution, and the Nurturance Gap", *Journal of Socio-Economics*, vol. 26 (2), pp. 111-126.
Statistics Canada (2005). Retrieved: 15 September, 2005, from http://www.statcan.ca/start.html.
Steingraber, Sandra (1998) *Living Downstream*, New York: Vintage Books.
Stiglitz, Joseph E. (2004) "Information and the Change in the Paradigm in Economics, Part 2", *The American Economist*, vol. 48 (1), pp. 17-49.
Stockhammer, Engelbert (2004) "Financialisation and the Slowdown of Accumulation", *Cambridge Journal of Economics*, vol. 28 (5), pp. 719-741.
Stockhammer, Engelbert, Harald Hochreiter, Bernhard Obermayr and Klaus Steiner (1997) "The Index of Sustainable Economic Welfare (ISEW) as an Alternative to GDP in Measuring Economic Welfare. The Results of the Austrian (Revised) ISEW Calculation 1955–1992", *Ecological Economics*, vol. 21, pp. 19-34.
Stone, Wendy (2001) "Measuring Social Capital. Towards a Theoretically Informed Measurement Framework for Researching Social Capital in Family and Community Life", *Australian Institute of Family Studies*, vol. 24, Research Paper, February 2001.
Stones, Mike (2006) "Food Hero: Tom Beaston", *The Ecologist*, vol. 36 (5), pp. 58-60.
Strasser, Susan (2002) "Making Consumption Conspicuous: Transgressive Topics Go Mainstream", *Technology and Culture*, vol. 43 (4), pp. 755-770.
Streeton, Paul (2002) "Reflections on Social and Antisocial Capital", in Jonathan Isham, Thomas Kelly and Sunder Remaswamy (Eds.), *Social Capital and Economic Development: Well-Being in Developing Countries*, Cheltenham, UK and Northampton, MA: Edward Elgar, pp. 40-57.
Studenski, Paul (1961) *The Income of Nations, Part One: History*, New York: New York University Press.
Stymne, Susanna and Tim Jackson (2000) "Intra-generational Equity and Sustainable Welfare: A Time Series Analysis for the UK and Sweden", *Ecological Economics*, vol. 33, pp. 219-236.
Sušjan, Andrej and Tjaša Redek (2008) "Uncertainty and Growth in Transition Economies", *Review of Social Economy*, vol. 66 (2), pp. 209-234.
Suzuki, David (2002) *Good News for a Change. Hope for a Troubled Planet*, Sydney: Allen & Unwin.
Szreter, Simon (2000) "Social Capital, the Economy, and Education in Historical Perspective", in Stephen Baron, John Field and Tom Schuller (Eds.), *Social Capital: Critical Perspectives*, Oxford: Oxford University Press.
Talberth, John and Alok Bohara (2006) "Economic Openness and Green GDP", *Ecological Economics*, vol. 58, pp. 743-758.

Talberth, John, Clifford W. Cobb and Noah Slattery (2007) *The Genuine Progress Indicator 2006 – A Tool for Sustainable Development*, Oakland, California: Redefining Progress.
Taylor, Amy (2005) *The Alberta GPI Summary Report – Genuine Progress? Alberta GPI*, Alberta, Canada: Pembina Institute for Appropriate Development.
Teichman, Judith (2008) "Redistributive Conflict and Social Policy in Latin America", *World Development*, vol. 36 (3), pp. 446-460.
The Ecologist (2003) "Special Report: Supermarkets", *The Ecologist*, vol. 34 (7), pp. 17-65.
Thomas, Pat (2003) *Living Dangerously: Are Everyday Toxins Making you Sick?*, Dublin: Newleaf.
Thompson, Craig J. (2004) "Marketplace Mythology and Discourses of Power", *Journal of Consumer Research*, vol. 31 (1), pp. 162-180.
Tinbergen, Jan (1994) "Policy Checking and Policy Making", in Clifford W. Cobb and John B. Cobb Jr. (Eds.), *The Green National Product – A Proposed Index of Sustainable Economic Welfare*, Lanham and New York: University of America.
Tobin, James (2005a) "Fisher's The Nature of Capital and Income", *The American Journal of Economics and Sociology*, vol. 64 (1), pp. 207-214.
Tobin, James (2005b) "Irving Fisher (1867-1947)", *The American Journal of Economics and Sociology*, vol. 64 (1), pp. 19-42.
Tomer, John F. (2002) "Human Well-Being: A New Approach Based on Overall and Ordinary Functionings", *Review of Social Economy*, vol. 60 (1), pp. 23-48.
Tsuru, Shigeto (1969) "Keynes Versus Marx: The Methodology of Aggregates", in David Horowitz (Ed.), *Marx and Modern Economics*, London and New York: Monthly Review Press, pp. 176-202.
Twomey, Paul (1998) "Reviving Veblenian Economic Psychology", *Cambridge Journal of Economics*, vol. 22, pp. 433-448.
Ulrich, Clare (2002) "High Stress and Low Income: The Environment of Poverty", *Human Ecology*, vol. 30 (4), p. 16(4).
UNCTAD (2008) *Creative Economy Report 2008*, New York: United Nations Conference on Trade and Development.
UNDESA (2006) *Diverging Growth and Development. World Economic and Social Survey 2006*, New York: United Nations Department of Economic and Social Affairs.
UNDESA (2007) *Development in an Ageing World. World Economic and Social Survey 2007*, New York: United Nations Department of Economic and Social Affairs.
UNDP-DESA (2008) *World Population Prospects: The 2006 Revision Population Database*, New York: United Nations Department of Economic and Social Affairs, Population Division.
UNDP (2007) *Human Development Report 2007/2008*, New York: Palgrave Macmillan.
UNECA (2008) *Economic Report on Africa 2008 - Africa and the Monterrey Consensus: Tracking Performance and Progress*, Addis Ababa, Ethiopia: United Nations Economic Commission for Africa.
UNEP (2007) *GEO-4 Yearbook*, Nairobi, Kenya: United Nations Environment Programme.
UNESC (2008) *Overview of the Economic and Social Conditions in Africa 2008*, New York: United Nations Economic and Social Council.
United Nations, European Commission, International Monetary Fund, Organisation for Economic Co-operation and Development and World Bank (1993) *System of National Accounts*, New York, sales no. E.94. XVII.4.
United Nations, European Commission, International Monetary Fund, Organisation for Economic Co-operation and Development and World Bank (2003) *Handbook of National Accounting, Integrated Environmental and Economic Accounting*.
Uzzell, David, Enric Pol and David Badenas (2002) "Place Identification, Social Cohesion, and Environmental Sustainability", *Environment and Behavior*, vol. 34 (1).
Vaughn, G. F. (1999) "Veblen's Possible Influence on the New Deal Land-Utilization Program as Evidenced by His Student Claud Franklin Clayton", *Journal of Economic Issues*, vol. 33 (3), pp. 713-727.
Veblen, Thorstein (1898) "Why is Economics not an Evolutionary Science?", *Quarterly Journal of Economics*, vol. 12 (4), pp. 373-397.
Veblen, Thorstein (1899) *The Theory of the Leisure Class*, New York: The Macmillan Company.
Veblen, Thorstein (1904) *The Theory of Business Enterprise*, Charles Scribner's Sons.
Veblen, Thorstein (1908) "Fisher's Capital and Income", *Political Science Quarterly*, vol. 23 (1), pp. 112-128.
Veblen, Thorstein (1910) "Christian Morals and the Competitive System", *International Journal of Ethics*, vol. 20 (2), pp. 168-185.

Veblen, Thorstein (1914) *The Instinct of Workmanship*, New York: B. W. Hueboch, Inc.
Veblen, Thorstein (1921) *The Engineers and the Price System*, New York: Harcourt, Brace and World [1963].
Veblen, Thorstein (1923) *Absentee Ownership and Business Enterprise in Recent Times: The Case of America*, Boston: Beacon, 1964.
Venetoulis, Jason and Clifford W. Cobb (2004) The Genuine Progress Indicator 1950–2002 (2004 Update), Redefining Progress: Sustainability Indicators Program, March 2004. Retrieved: 14 September, 2007, from http://www.redefiningprogress.org/newpubs/2004/gpi_march2004update.pdf.
Voinov, Alexey and Joshua Farley (2007) "Reconciling Sustainability, Systems Theory and Discounting", *Ecological Economics*, vol. 63, pp. 104-113.
Wakefield, Julie (2004) "Fighting Obesity Through the Built Environment", *Environmental Health Perspectives*, vol. 112 (11), pp. 616-618.
Waring, Marilyn (2009) "Policy and the Measure of Woman", in Ariel Salleh (Ed.), *Eco-Sufficiency and Global Justice: Women Write Political Ecology*, London: Pluto Press, pp. 166-179.
Warr, P. (2001) "Poverty Reduction and Sectoral Growth: Evidence from Southeast Asia", in *Paper presented for the WIDER Development Conference Growth and Development*, Helsinki, 25-26 May.
Wen, Zongguo, Yan Yang and Philip A. Lawn (2008) "From GDP to the GPI: Quantifying Thirty-Five Years of Development in China", in Philip A. Lawn and Matthew Clarke (Eds.), *Sustainable Welfare in the Asia-Pacific*, Cheltenham, UK: Edward Elgar, Ch.9, pp. 228-259.
Wen, Zongguo, Kunmin Zhang, Bin Du, Yadong Li and Wei Li (2007) "Case Study on the Use of Genuine Progress Indicator to Measure Urban Economic Welfare in China", *Ecological Economics*, vol. 63, pp. 463-475.
Wikipedia (2009) "Complement (Set Theory)". Retrieved: 19 January, 2009, from http://en.wikipedia.org/wiki/Complement_(set_theory).
Wilber, Charles K. and Robert S. Harrison (1978) "The Methodological Basis of Institutional Economics: Pattern Model, Storytelling, and Holism", *Journal of Economic Issues*, vol. 12 (1), pp. 61-89.
Wish, N. D. (1986) "Are We Really Measuring the Quality of Life? Well-being has Subjective Dimensions, as well as Objective Ones", *American Journal of Economics and Sociology*, pp. 3-99.
Wolff, Edward N. and Ajit Zacharias (2007) "The Impact of Wealth Inequality on Economic Well-Being", *Challenge*, vol. 50 (4), p. 65.
World Bank (2008) *World Development Indicators*, Washington, D.C.: WDI Online Individual Subscription, Available Online: http://www.worldbank.org [Data Retrieved: 30 September, 2008].
World Values Survey Database (2006) *European and World Values Surveys Four-Wave Integrated Data File, 1981-2004, v.20060423, 2006* The European Values Study Foundation and World Values Survey Association.
Wright, David McCord (1951) *Capitalism*, New York: McGraw-Hill.
Wunder, Timothy A. (2007) "Toward an Evolutionary Economics: The 'Theory of the Individual', Veblen-Schumpeter", *Journal of Economic Issues*, vol. 61 (3), pp. 827-839.
WWF (2008) *Living Planet Report 2008*, Switzerland: World Wide Fund For Nature.
Yonay, Yuval P. (1998) *The Struggle over the Soul of Economics*, Princeton, New Jersey: Princeton University Press.
Young, Alan H. and Carol S. Casron (1994) "The ISEW from a National Accounting Perspective", in Clifford W. Cobb and John B. Cobb Jr. (Eds.), *The Green National Product – A Proposed Index of Sustainable Economic Welfare*, Lanham and New York: University of America, pp. 111-134.
Zacharias, Ravi (1997) *Deliver Us From Evil. Restoring the Soul in a Disintegrating Culture*, United States: W Publishing Group.
Zacharias, Ravi (2008) "Grace", in *By Whose Standard?*, Toronto, Ontario: RZIM Zacharias Trust Summer School, Oriel College, Oxford England (1–6 July 2007) [CD309, CD Number Three].
Ziegler, Rafael (2006) *Political Perception and the Ensemble of Value and Measure*, McGill University, Montreal, Quebec, Canada: Governance for Sustainable Development, GoSD Working Paper No. 4, March 2005 (Updated January 2006).
Ziegler, Rafael (2007) "Political Perception and the Ensemble of Value: The Paradox of the ISEW", *Environmental Values*, vol. 16, pp. 43-60.
Zolotas, Xenophon (1981) *Economic Growth and Declining Social Welfare*, New York: New York University Press.